University of Alberta
Printing Department

CALENDAR

of the

University of Alberta

EDMONTON

Fifty-ninth Session

1966-67

The University of Alberta is a co-educational, publicly-supported institution, sharing with the University of Calgary the sole right of conferring degrees, other than degrees in Divinity, within the Province of Alberta. It is a member of the Association of Universities of the British Commonwealth, of the Association of Universities and Colleges of Canada and of the International Association of Universities.

Instruction at the University began in September 1908, in the Faculty of Arts and Science, which was first officially so designated in 1914. In 1963, the Faculty at Edmonton became the separate faculties of Arts and of Science. Teaching in other fields was established as follows: 1912—Law; 1913—Medicine and Engineering; 1914—Pharmacy; 1915—Agriculture; 1917—Dentistry; 1918—Household Economics; 1924—Education and Nursing; 1928—Commerce; 1950—Physical Education; 1954—Physiotherapy; 1961—Dental Auxiliary; 1962—Dental Hygiene. Graduate Study began slowly in the early years but has increased rapidly since 1950; the Faculty of Graduate Studies was established in 1957.

The Department of Extension was initiated in 1912, and the Banff School of Fine Arts in 1933.

University classes began at Calgary in 1946; the first year of Arts and Science was provided in 1951, and the first year of various degree courses and the second and later years of some have gradually been added. The University at Calgary issues its own calendar.

The University possesses 878 acres (campus, 154 acres; farm 724 acres.) Additional land adjoining the campus is gradually being acquired for future development. The campus, located about two miles from the business centre, borders the wooded southern bank of the North Saskatchewan river. It contains some sixteen major teaching and research buildings, in addition to student residences, service buildings and two affiliated colleges. Adjoining are the Alberta Research Council, the Provincial Laboratory of Public Health, two teaching hospitals and the Northern Alberta Jubilee Auditorium.

At Calgary, the new campus extends to about 320 acres, and is situated on the Banff Highway, at the western limits of the city.

The Banff School of Fine Arts is located in the mountains. A few courses for university credit may be taken there in the summer months.

As this calendar is published a considerable time before the opening of the Session, the University reserves the right to make whatever changes circumstances may require, including cancellation of particular courses.

Date of issue: July, 1966.

Printed by the University of Alberta, Edmonton

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I

Academic Schedule

1966 CALENDAR 1966

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I—ACADEMIC SCHEDULE, 1966-67

1966

July—

Friday, 1—

Sixtieth University Year begins.

Monday, 4—

Last day for receiving applications for admission to Law.

8:00 a.m.—Summer Session lectures begin.

9:00-11:00 a.m. and 12:00 noon to 2:00 p.m.—Confirmation of registration of Summer Session students.

Monday, 11—

Last day for payment of 1966 Summer Session fees.

Friday, 15—

Last day for receiving applications for undergraduate admission from outside Canada.

Last day for application for Graduate degrees, and degrees in Arts, Commerce, Education, Household Economics, Pharmacy and Science to be conferred at Fall Convocation.

August—

Monday, 1—

Last day for students with unsatisfactory university records to notify the Student Counselling Services that they are seeking re-admission.

Last day for receiving formal applications for admission from residents of Canada seeking admission to undergraduate programs except the M.D. (April 1), D.D.S. (May 15), and LL.B. (July 4) programs. This requirement also applies to students of the University at Calgary who wish to attend the University at Edmonton.

Last day for receiving applications for supplementals in Dentistry, Dental Hygiene, Medicine, and first year Rehabilitation Medicine courses.

Tuesday, 9—

Last day for receiving applications for regular supplementals in all faculties and schools except those mentioned in the preceding entry.

Monday, 15—

Supplemental examinations begin in Dentistry, Dental Hygine, Medicine and first year Rehabilitation Medicine courses.

Summer Session final examinations begin.

Monday, 29—

Supplemental examinations begin except in programs listed under August 15.

Wednesday, 31—

Last day for receiving formal applications for admission to the Faculty of Graduate Studies.

Last day for receiving registrations in the Evening Credit Program (including students in the Faculty of Graduate Studies). Applications for admission from new students must have been received by the deadlines referred to above.

September—

Monday, 5—

Labor Day; University buildings closed.

Tuesday, 6—

9:00 a.m.—Registration of all students in the D.D.S. program, and of second year students in the School of Rehabilitation Medicine.

1:30 p.m.—Lectures begin for second year students in Rehabilitation Medicine.

2:00 p.m.—Registration of all students in the M.D. program.

Wednesday, 7—

8:00 a.m.—Lectures begin in second, third and fourth years in faculties of Dentistry and Medicine.

Wednesday, 7 and Thursday, 8—

—Orientation exercises for first year Medical and Dental students.

Thursday, 8 and Friday, 9—

Registration and orientation exercises for students in the School of Dental Hygiene.

Friday, 9—

Lectures begin in first year in faculties of Dentistry and Medicine.

Monday, 12—

Registration of students in the Faculty of Law.

Lectures begin in the School of Dental Hygiene.

Monday, 12 to Friday, 16—

Last week for securing departmental approval of Graduate Program forms.

Tuesday, 13—

8:00 a.m.—Lectures begin in the Faculty of Law.

Thursday, 15—

Applications from M.D. and D.D.S. students for grants or loans under the Students' Assistance Act or the Canada Student Loans Act should be filed by this date.

Monday, 19 to Thursday, 22—

Registration of all students in Agriculture, Arts, Business Administration and Commerce, Divinity, Education, Engineering, Graduate Studies, Household Economics, Medical Laboratory Science, Nursing, Pharmarcy, Physical Education, first and third years of Rehabilitation Medicine, and Science, according to published schedule.

Friday, 23—

Regular lectures begin for all students registering in previous four days.

Saturday, 24—

Special supplemental examinations.

Monday, 26—

Evening Credit Program classes begin.

October—

Monday, 3—

Applications from other than M.D. and D.D.S. students for grants or loans under the Students' Assistance Act or the Canada Student Loans Act should be filed by this date.

Last day for submission of theses by graduate students expecting to receive their degrees at Fall convocation.

Wednesday, 5—

Last day for changes in registration in Agriculture, Arts, Business Administration and Commerce, Education, Engineering, Household Economics, Medical Laboratory Science, Nursing, Pharmacy, Physical Education, Rehabilitation Medicine, and Science.

Saturday, 8—

Dental Aptitude Tests for pre-dental students.

Monday, 10—

Thanksgiving Day; University buildings closed.

Monday, 17—

Last day for payment of undergraduate fees.

Thursday, 20—

Last day for oral examination of Masters and Doctoral candidates for Fall Convocation.

November—

Monday, 7—

Notice of intention to be absent from Fall Convocation must be given by 4:30 p.m.

Monday, 7 to Saturday, 12—

Test Week.*

Friday, 11—

Remembrance Day; lectures and laboratories withdrawn.

Thursday, 17—

Fall meeting of Committee on Student Affairs.

Friday, 18—

Fall meeting of the University Senate.

Saturday, 19—

(afternoon)—Fall Convocation.

December—

Saturday, 17—

12:00 noon—Lectures end, and Christmas vacation begins.

Saturday, 31—

Last day for receipt of applications for Certificates of Post-Graduate Qualification in Medicine.

1967

January—

Monday, 2—
Christmas vacation ends.

Tuesday, 3—
8:00 a.m.—First term lectures resume.
Applications for admission to Dentistry and Medicine from pre-professional students attending here should be submitted by this date.

Saturday, 7—
Last day of lectures in the first term except in the LL.B. and M.D. programs.
Dental Aptitude Tests for pre-dental students.

Monday, 9 to Saturday, 14—
Mid-session examinations, except in the LL.B. and the M.D. programs.

Monday, 16—
Last day for payment of second instalment of fees.
Second term lectures begin.

February—

Friday, 3—
Last day for application for Graduate Degrees and degrees in Arts, Commerce, Education, Household Economics, Pharmacy, and Science. to be conferred at Spring Convocation.

Saturday, 18—
Lectures and laboratories withdrawn—Varsity Guest Weekend.

Friday, 24—
Winter meeting of the University Senate.

March—

Friday, 10—
(Evening)—Centennial Convocation.

Tuesday, 21—
Spring meeting of the Committee on Student Affairs

Thursday, 23 to Sunday, 26 (inclusive)—
Second term recess.

Friday, 24—
Good Friday; University buildings closed.

Monday, 27—
Last day for receiving applications for supplemental examinations to be written in April or May.

April—

Monday, 3—
Last day for receipt of applications for admission from new students, undergraduate or graduate, who wish to enter the University in the 1967 Summer Session.
Last day for receiving applications for admission to Medicine.

Thursday, 6—

Last day of lectures for second-year Civil and Mining Engineering students.

Monday, 10 to Saturday, 15—

Final examinations for second-year Civil and Mining Engineering students.

Thursday, 13—

Last day for submission by graduate students of theses.

Last day of lectures for students in Agriculture, Arts, Business Administration and Commerce, Education, Engineering, (except second year Civil and Mining Engineering—see April 6), Graduate Studies, Household Economics, Medical Laboratory Science, Nursing, Pharmacy, Physical Education, Rehabilitation Medicine, and Science.

Monday, 17—

Survey School begins for second-year Civil and Mining Engineering students.

Tuesday, 18—

Final examinations begin for students mentioned under April 13.

Saturday, 22—

Last day of lectures in Law.

Monday, 24—

Final examinations begin in Law.

Friday, 28—

Last day for oral examinations for Masters and Doctoral candidates.

Saturday, 29—

Last day of lectures in fourth year Medicine.

May

Monday, 1—

Last day for registration of students in the Summer Session.

Field experience begins for final year degree and diploma students in School of Nursing.

First year B.Sc. Nursing students begin one month's clinical experience.

Tuesday, 2—

Outdoor School begins for second year students in B.P.E. and B.A. in Recreation Administration programs.

Wednesday, 3—

Final examinations begin in fourth year Medicine.

Friday, 5—

Survey School ends.

Saturday, 6—

Last day of lectures in Dental Hygiene, Dentistry, and in first, second and third years of Medicine.

Monday, 8—

Final examinations begin in Dentistry, Dental Hygiene, and in first second and third years of Medicine.

Four months period of Hospital Practice for students in School of Rehabilitation Medicine begins.

Tuesday, 9—

Charter Day.

Wednesday, 10—

Notice of intention to be absent from Convocation must be given by 12:00 noon.

Sunday, 14—

Outdoor School ends for second year B.P.E. and B.A. in Recreation Administration students.

Monday, 15—

Last day for receiving applications for admission to Dentistry.

Field Training Program begins for first-year Dental Auxiliary students.

Third-year B.Sc. (M.L.S.) students begin year of practical training.

Monday, 29—

Spring meeting of the Senate.

Tuesday, 30—

Convocation (Part I) for the conferring of degrees and diplomas.

Wednesday, 31—

Convocation (Part II) for the conferring of degrees and diplomas.

June

Monday, 5—

Last day for payment of 1967 Summer Session fees without penalty.

Friday, 30—

Sixtieth University year ends.

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*Students will not be granted permission to leave the campus for extra-curricular activities during test weeks.

II—PROGRAMS OF STUDY

Faculty or School	Degree or Diploma	Years required (after senior matriculation unless otherwise shown) to complete course
*Agriculture	B.Sc.	4
Arts	B.A.	3
	B.A. Honors	4
	B.F.A.	4
	B.Mus.	4
Business Administration and Commerce	B.Com.	4
Dentistry	D.D.S.	4 (after two pre-professional years)
Dental Hygiene	Dental Auxiliary or Dental Hygiene	2
Divinity (Committee on the Degree of Bachelor of Divinity)	B.D.	see Section XXIV
Education	B.Ed.	4
	B.Ed. in Industrial Arts	4
	B.Ed. in Vocational Education	4
	Diploma in Education	see Education Calendar
Engineering (Civil, Chemical, Electrical, Mechanical, Metallurgical, Mining)	B.Sc.	4
Graduate Studies	M.A., M.B.A., M.Ed., M.Sc., Ph.D., Ed.D.	see Graduate Studies Calendar
Household Economics	B.Sc.	3
Law	LL.B.	3 (after B.A. or other acceptable degree)
(with Arts)	B.A., LL.B.	5
Medicine	M.D.	(4 after 2 yrs. pre-med.)
	B.Sc.	1 (see Medicine Calendar)

*The Faculty of Agriculture also offers a two year special program in Pre-Veterinary Medicine.

Faculty or School	Degree or Diploma	Years required (after senior matriculation unless otherwise shown) to complete course
Medicine (cont'd)	B.Sc. in Medical Laboratory Science	4
Nursing	B.Sc.	4
	Diploma in Public Health	1 (after Hospital Graduation)
	Diploma in Teaching and Supervision	1 (after Hospital Graduation)
Physical Education	B.P.E.	3
	B.A. in Recreation Administration	4
Rehabilitation Medicine	Diploma in Physical Therapy	3
	Diploma in Occupational Therapy	3
Pharmacy	B.Sc.	4
Science	B.Sc.	3
	B.Sc. Honors	4

EVENING CREDIT PROGRAM

Through its Evening Credit Program, the University offers credit courses at various centres in the evening and on Saturdays for the convenience of persons employed during the day. 1965-66 courses were offered at the following centres in Northern and Central Alberta; Edmonton, Camrose, Evansburg, Grande Prairie, Radway, Red Deer, Vegreville, Viking, Westlock, and Wetaskiwin. An Evening Credit Program Calendar is published and can be obtained from the Office of the Registrar.

SUMMER SESSION

The University conducts a Summer Session at Edmonton. Established primarily to meet the needs of teachers, Summers Sessions provide a variety of courses for the convenience of candidates for various degrees who are unable to attend the regular sessions. A calendar is published and is available from the Registrar's Office.

ADMISSION REQUIREMENTS

FACULTY OR SCHOOL	PROGRAM	SUBJECT OF ALBERTA GRADE XII (Senior Matriculation) REQUIRED FOR ADMISSION (with average of at least 60.0%)								REMARKS	This Column Refers to Notes on pages 18 & 19
		English 30	Social Studies 30	Maths. 30	Maths. 31*	Chem. 30	Phys. 30	Biol. 30	French 30 German 30 Latin 30 Ukrain. 30		
Agriculture	B.Sc.	C	C	C		O	O	O	‡O	3 compulsory: 3 options. Admission will also be granted on basis of Diploma from Provincial School of Agriculture provided applicant possesses certain Grade XI and XII credits. For details see Agriculture calendar.	Note 2
Arts	B.A. B.A., LL.B. B.Mus. B.F.A.	C C C C	C C C C	C C C C		O O O O	O O O O	O O O O	C‡O C‡O C‡O C‡O	4 compulsory: 2 options. Either two sciences or two languages are required. Ukrainian 30 acceptable only as second language. For admission to B.A., LL.B., average of at least 65.0% required. For B.Mus. marticulants must also have completed Western Board of Music Grade VIII practical and Grades IV and V theoretical examinations.	Notes 2, 3, 8
Business Administration and Commerce	B.Com.	C	C	C	O	O	O	O	‡O	3 compulsory: 3 options.	Note 2
Dental Hygiene	Dental Auxiliary or Hygiene Diploma	C	C	O		C	O	O	O	3 compulsory: 3 options (Biology 30 recommended).	Notes 2, 6
Dentistry	D.D.S.									Satisfactory completion of at least 2 years of university work after senior matriculation including full courses in inorganic chemistry, organic chemistry, physics and biology is required for admission.	Note 5
Education	B.Ed.	C	C	O	O	O	O	O	‡O O O	2 compulsory: 4 options (Math. 31 acceptable as option, only if credit obtained by Departmental exam in June '62 or after. Music 30 is also acceptable option).	Notes 1, 2, 4, 7
	B.Ed. in Vocational Education	C	C	O	O	O	O	O	‡O O O	2 compulsory: 4 options; also, either 35 credits in Vocational Education with average of at least 60% or Journeyman's certificate or equivalent required. (See Education Calendar)	
Engineering	B.Sc.	C	C	C	C	C	C			6 compulsory. Students presenting Chem. 30 without approved lab will have to satisfy Dept. of Chem. as to their proficiency in lab.	Note 1
Household Economics	B.Sc.	C	C	C		C	O	O	‡C	5 compulsory: 1 option (Physics is recommended).	Note 2

Law	LL.B.									Either a B.A. (or equivalent degree) or completion of the first two years of the B.A., LL.B. program is required for admission to Law.	
Medicine	M.D.									Satisfactory completion of at least 2 years of university work after senior matriculation including full courses in inorganic chemistry, organic chemistry, physics and biology is required for admission.	Note 5
	B.Sc. in Medical Lab. Science	C	C	C		C	O	O	‡O	4 compulsory: 2 options. An average of at least 65% is required.	Notes 2, 5, 6
Nursing	B.Sc. or Dipl. in Public Health or Teaching & Supervision	C	C	O		C	O	C	‡O	4 compulsory; 2 options.	Note 2
Pharmacy	B.Sc.	C	C	C		C	O	O	‡O	4 compulsory: 2 options (Physics 30 and Biology 30 are recom.)	Notes 2, 6
Physical Education	B.A. in Recreation Administration	C	C	O	O	O	O	O	‡O O O	2 compulsory: 4 options. (Math. 31 acceptable as option, only if credit obtained by Departmental Exam in June '62 or after. Music 30 is also acceptable option.)	Notes 1, 2, 7
	B.P.E.	C	C	O		C	O	O	‡O O O	3 compulsory: 3 options (Biology 30 recommended).	
Rehabilitation Medicine	Dip. in Physical Therapy Dip. in Occupational Therapy	C	C	C	O	O	O	C	‡O	4 compulsory: 2 options (one of Physics 30 or Chemistry 30, and one of Math. 31 or French 30 or German 30 or Latin 30.)	Notes 1, 2, 6
Science	B.Sc.	C	C	C	†	O	O	O	‡C	4 compulsory: 2 options. †Mathematics 31 is also compulsory for certain Honors programs and recommended for certain General programs. For details see Science Calendar.	Notes 1, 2

(1) In above columns "C" denotes a compulsory subject, "O" an option. The minimum acceptable mark is 50%, the average 60.0%.
(2) An Alberta High School Diploma is normally required.
(3) A student from another Province in Canada who has obtained clear senior matriculation for the University or Universities of that Province will be admitted to the University of Alberta with clear matriculation subject to the requirements for the first year courses in each program. Students who do not have clear matriculation on this basis will be required to complete full Alberta matriculation of the Faculty to which admission is sought.
(4) Further details may be found in the faculty sections of the calendar.
‡Other languages at an equivalent level may also be accepted.
*Mathematics 31 mark not counted in computing required average unless departmental examination was written in 1962 or subsequently.

These general regulations notwithstanding, the University may in its discretion refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements of the University.

Admission requirements are subject to change, therefore for complete details and regulations governing each academic session, applicants are advised to consult, prior to registration, the appropriate section of the calendar for the Faculty or School into which they are seeking admission.

ADMISSION REQUIREMENTS—ADDITIONAL NOTES

1. **Mathematics 31** is compulsory for admission to the Faculty of Engineering and to Honors Mathematics, Honors Physics, and Honors Physics and Geology programs in the Faculty of Science. It is one of the acceptable options for admission to the Bachelor of Education programs, the B.A. in Recreational Administration program in the Faculty of Physical Education, the B.Com. program, and the diploma programs in the School of Rehabilitation Medicine.

2. **Biology 32** will be accepted as a matriculation subject only if taken before September 1965, except in the Faculty of Education where it will be accepted if taken before September, 1966. Biology 30 will normally be a compulsory matriculation subject for admission to the School of Nursing and the School of Rehabilitation Medicine effective September 1966.

3. **Foreign language requirement for the Faculty of Arts:** The compulsory foreign language normally will be one of French 30, Latin 30, or German 30. However, Greek, Italian, Russian, or Spanish at an equivalent level will also be accepted. If a second matriculation language is presented, it may be any of the languages mentioned above or any other language (at an equivalent level), provided it is not from the same linguistic group as the first matriculation language. Students wishing to present a language not mentioned above should submit to the Dean of Arts evidence of their attainment in that language.

4. **Special suggestions regarding options for certain "majors" in the Faculty of Education:**
   (a) Students intending to major in biological sciences or household economics should present Chemistry 30 or equivalent.
   (b) Students intending to major in physical sciences should present Chemistry 30, Physics 30, and Mathematics 30 or equivalents.
   (c) Students intending to major in mathematics should present Mathematics 31 in addition to Mathematics 30.
   (d) Students intending to major in music should present Western Board of Music Grade II Theory and Grade V Practical or Royal Conservatory Grade I theory and Grade V Practical.

5. **Pre-Professional Requirements for the Faculty of Dentistry and the Faculty of Medicine:** Matriculants are advised to enter either the Faculty of Science or the Faculty of Arts to fulfill requirements for admission to either the Faculty of Dentistry or the Faculty of Medicine. (The Medical Laboratory Science program is not recommended as a pre-professional course for the M.D. program.) A minimum over-all average of at least 65% in all preceding university work is required for admission. Because of limited facilities, the successful completion of a pre-professional program does not guarantee admission to the Faculty of Dentistry or the Faculty of Medicine.

6. **Limited enrolment for Dental Hygiene, Medical Laboratory Science, Pharmacy, and Rehabilitation Medicine:** Because of limited facilities, there can be no guarantee given that the University will be able to admit applicants

who meet the minimum admission requirements. Preference will normally be given on the basis of academic merit.

7. **Music 30** is acceptable as an option for the Bachelor of Education programs and the B.A. in Recreational Administration program in the Faculty of Physical Education. In terms of Western Board of Music, Grade VIII Practical and Grade V Theory are required. In terms of Royal Conservatory, Grade VIII Practical and Grade III Harmony are required. Students must present their documents to the Alberta Department of Education for evaluation.

8. Applicants who have successfully completed the Grade V Theory examinations of the Royal Conservatory of Music of Toronto, or the Grade VII Theory examinations of the Western Board of Music, or the equivalent, may present such qualification in lieu of one of the matriculation options for admission to the B.A., B.F.A. or B.Mus. programs.

III—ADMISSION (PROCEDURES)

The courses of study in the University are, unless otherwise specified, open to men and women on equal terms.

Enrolment in any faculty or school must necessarily be limited to the number of students who can be accommodated. Students are normally accepted in the order of their academic standing from among the whole list of applicants.

APPLICATIONS AND TRANSCRIPTS

Prospective undergraduate students who have not previously attended the University of Alberta at Edmonton must secure and complete Application for Admission forms and must submit them to the Registrar, University of Alberta, Edmonton **by the prescribed deadline. This requirement also applies to students of the University at Calgary who wish to transfer to the Edmonton campus.** Graduate students should obtain forms from the Dean of Graduate Studies and should return them to him when they have been completed. Alberta Grade XII students may obtain application forms and transcript order cards from the Principal or Counsellor of their high school. Other prospective applicants for admission to undergraduate programs may obtain forms from the Registrar of the University at Edmonton.

Since the deadline for recipt of applications for admission to most undergraduate programs is August 1, applicants should complete and return their applications before that date and should not wait to receive the results of supplemental examinations before applying (see deadlines below). *Applications received after the deadline will be subject to a penalty fee of $10.00 for the first day, plus $1.00 for each subsequent day, up to a maximum of $25.00.*

In addition, every applicant should arrange, **prior to the deadline,** for the Registrar of the University (or the Dean of Graduate Studies if he is applying for entrance to that Faculty) to receive an **official transcript** of his high school

education (and **two** transcripts of any courses taken at another university or college or at the University at Calgary), **to be sent direct from the Department of Education or other institution maintaining such records.** Alberta applicants should apply to the Examinations Branch **before August 1,** to have a transcript of their high school records, including the June Department Examinations, sent to the University as soon as the results of these examinations become available.

RESTRICTIONS

Any applicant, who, after the June examinations, has deficiencies due to failures that would require him to write more than two Departmental Examinations in August to meet the admission requirements, will not be considered for admission in the same year. Moreover, any applicant who has had to write what the University considers to be an inordinate number of examinations because of failures and low marks, in order to attain the nominal entrance requirements of the University, may be refused admission on the grounds that his chances for success at the University level are remote.

DEADLINES

Applications for admission to M.D. program	April 1
Applications for admission to D.D.S. program	May 16
Applications for admission to other undergraduate programs	August 1
Applications for admission to Graduate Studies	August 31

VISE FEE

A fee of $5.00 is charged for the evaluation of educational documents issued in Canada but outside Alberta; the fee is $10.00 for documents issued in other countries. Students entering the Faculty of Graduate Studies are exempt from visé fees.

MEDICAL EXAMINATION

Every applicant for admission must have a medical examination and arrange for the results of the examination to be reported to the University, before his application wil be regarded as complete. A medical examination report form will be supplied to each prospective applicant with his application form.

The applicant should present the medical report form to his own physician when he appears for his examination. This should be done early in August since all medical reports should be in the hands of the Director, Student Health Services, before August 15 to ensure adequate time for review.

Special arrangements exist in the School of Nursing.

Students from the University at Calgary who are applying for admission to the University at Edmonton may apply to the Calgary Student Health Services to transfer their medical records to the Student Health Services at Edmonton instead of having a further medical examination.

ADVANCED STANDING

Students from other universities may be admitted to advanced standing. Extramural credits from recognized universities may be accepted under certain conditions, but such credits will not be considered beyond the first year of university work. Students who have taken the equivalent of university

courses in some other manner may be given advanced placement (i.e. excused from taking such courses) but will not necessarily be granted advanced standing in them. They may be required to substitute other courses in order to complete a program of normal weight at this university.

All such applications for admissions should be addressed to the Registrar well in advance of the beginning of the session. Each application will be dealt with on its merits. The university reserves the right to require applicants for advanced standing or advanced placement to write examinations at any level including that of matriculation.

The amount of advanced standing that may be granted is limited by the residence requirements of the University, which provide that a student proceeding towards a first degree will normally be required to attend at least one academic year as a full-time student.

CLASSIFICATION OF STUDENTS

Students are classified as graduates, undergraduates (full-time or part-time), specials, and auditors.

Graduate Students are admitted to the Faculty of Graduate Studies in one of the following categories:

1. *Candidate for a master's degree.*
2. *Provisional candidate for a doctor's degree*:
   All Ph.D. and Ed.D. students are classified as provisional candidates until they have passed their Candidacy Examinations.
3. *Probationary graduate student* is one whose university record is either: (a) difficult to assess (e.g. some foreign students) or (b) below the standard normally required.
4. *Conditional graduate student* is one who is required to take undergraduate courses prerequisite to, and in addition to, the graduate program. Fees for such courses are not included in graduate program fees.
5. *Special graduate student* is one who wishes to take graduate courses for purposes other than degree credit at this university.

Undergraduate Students are those who possess full senior matriculation and who are taking one or more courses for credit towards an undergraduate degree. These students fall into two categories:

(a) *Full-time students*—i.e. those who are registered in two thirds or more of a full year's work.

(b) *Part-time students*—i.e. those who are registered in less than two-thirds of a full year's work.

Extramural Students are those who are permitted to take a course without attending lectures. This privilege is sometimes granted to graduate students, B.Ed. candidates who possess a previous degree, and other students who have failed in one course in their graduating year and who are permitted to repeat the course without attendance.

Special Students are those who, although registered in one or more courses, are currently neither seeking credit towards a degree or diploma, nor entrance into a graduate program.

Auditors are students who have been granted official permission to attend lectures in a course on the understanding that they may not participate in class discussion, assignments or examinations. The audit privilege is restricted to a student who is currently registered in a degree or a diploma program, and who presents to the Registrar written permission from the instructor in the course, endorsed by the student's Dean or Director, to register in the course as an Auditor.

THE FACULTY OF GRADUATE STUDIES

The Faculty of Graduate Studies administers programs leading to the degrees of Master of Arts, Master of Business Administration, Master of Education, Master of Science, Doctor of Philosophy, and Doctor of Education, and makes recommendations for granting the degrees of Doctor of Science and Doctor of Letters. Graduates who take courses in the University but are not at the time candidates for a degree are also enrolled in the faculty as "special graduate students".

Full details of regulations and programs of study will be found in the section of the calendar relating to the Faculty of Graduate Studies.

IV—REGISTRATION AND FEES

REGISTRATION PROCEDURE

Students should consult the Academic Schedule at the front of this calendar for registration dates. Further necessary details will be supplied prior to registration.

Students are required to register for courses in which they are deficient before registering for other courses. The faculty councils reserve the right to adjust courses to meet the requirements of time-tables of lectures and examinations. The program of work for which a student seeks registration is in every case subject to the approval of the Registrar and the faculty concerned.

Graduate students carrying on full-time research or other academic work during the summer months may receive residence credit by registering with the Faculty of Graduate Studies for the whole, or a portion, of the period extending from the end of one regular winter session to the beginning of the next; this period is known as the Intersession. Application for such registration should be made as soon as the applicant's plans for this period are final.

N.B.—A student is responsible for the completeness and accuracy of his registration. He is also responsible for any adjustments of registration made necessary by the results of supplemental examinations. Particular care should be exercised with regard to prerequisite courses. Registration in courses which directly conflict on the timetable will be allowed only when the permission of the Faculty Council concerned has been secured.

LATE REGISTRATION

Students are normally required to complete their registration, in person, by the date specified in the academic schedule. After the end of the registration period, registration will be permitted only in exceptional circumstances and with the payment of a penalty fee of $3.00 plus $1.00 per day. Where

possible, application for late registration should be made to the Registrar in advance of the normal registration period.

CHANGES IN REGISTRATION

A student may not abandon a course or change from one course to another without first obtaining permission from his Dean or Director. This permission in the form of a "Change of Registration" slip, signed by the Dean or Director must be presented to the Registrar before the change becomes official. Changes in registration will not normally be approved after the deadline appearing in the Academic Schedule.

CANCELLATION OF REGISTRATION

A student who wishes to withdraw from the University should report at once to the Student Counselling Services in order to complete Notice of Withdrawal forms which must then be submitted to his Dean or Director for approval. A student who withdraws without completing such forms will not be eligible for any refund of fees, nor for exemption from fees in the event that he has not paid them.

FEES

(Make all cheques payable **at par** to **University of Alberta.**)

The University reserves to itself the right to change these fees from year to year without notice.

Registration is incomplete until fees have been paid and is subject to cancellation unless payment has been made by the final date according to the regulations as stated in the section, "Payment of Fees".

When a student withdraws with the approval of his Dean an adjustment will be made on a pro rata basis except that no refunds will be made where withdrawal or cancellation is subsequent to March 15. In the case of a full-time undergraduate student an administrative charge of $10 will be made. In any other case the administrative charge will be the amount of the registration fee.

The following special fees are applicable to all faculties and will be assessed in particular cases as they apply:

For viséing certificates (Not applicable in Graduate Studies.)	
Canadian	$ 5.00
Others	10.00
For transcript of record	1.00
For supplemental examination, each subject	10.00
For special supplemental examinations, each subject	40.00
Late registration	$3.00+$1.00 per day

UNDERGRADUATE PROGRAMS

I—Full-time Students

General Fees

Students' Union:	
General	$12.50
Building	15.00
University Athletic Board	7.00
	$34.50

Instruction Fees

Faculty of Arts:

(a) B.A.:
Per session $300.00

(b) B.Mus.:
Per session 300.00

(c) B.F.A. or Diploma in Art:
Per session 300.00

(d) Arts and Law:
Per session, 1st and 2nd years 300.00

Faculty of Science:
B.Sc.:
Per session 350.00

Faculty of Agriculture:
Per session 350.00

Faculty of Business Administration and Commerce:
Per session 350.00

School of Dental Hygiene:
Dental Auxiliary or Dental Hygiene per session $350.00

Faculty of Dentistry:
Per session 500.00

Faculty of Education:
Per session 300.00

Faculty of Engineering:
Per session 400.00

School of Household Economics:
Per session 350.00

Faculty of Law:

(a) Arts and Law:
Per session, 3rd, 4th and 5th years 350.00

(b) Law:
Per session 350.00

Faculty of Medicine:

(a) M.D.:
Per session, first year $500.00
Per session, subsequent years 550.00

(b) B.Sc. in Medical Laboratory Science:
Per session, first, second and fourth years 350.00
Per session, third year 200.00

(c) B.Sc. in Medicine:
Per session 350.00

School of Nursing:

Degree Course (four-year Basic and Post-Basic) per session	350.00
Diploma Course (Public Health Nursing or Teaching and Supervision)	350.00
Five-year Degree Course—Second Year	50.00
—Third and Fourth Year	Gratis
—Fifth Year	350.00

For General Fees, see the Nursing Calendar.

Faculty of Pharmacy:

Per session	350.00

Faculty of Physical Education:

Per session	300.00

School of Rehabilitation Medicine:

Per session	300.00

II—Part-time Students

General Fees

	1 Course	2 Courses	3 Courses
Registration	$ 2.00	$ 2.00	$ 2.00
Medical Services*			12.00
Students' Union		9.00	27.50
University Athletic Board**	7.00	7.00	7.00

*Optional at registration only (not available for students taking less than 3 courses).

**Optional at registration.

Instruction Fees

	Full Course	Half Course
Agriculture	$100.00	$50.00
Arts	100.00	50.00
Business Administration and Commerce	100.00	50.00
Education	100.00	50.00
Household Economics	100.00	50.00
Science	100.00	50.00
Auditor	12.00	6.00

In all other schools and faculties the fee assessment will be based upon the proportion the hours of instruction in the courses taken bear to the total number of hours of instruction in a normal year's work in the faculty concerned. For the purpose of assessment of fees, students who are taking two-thirds or more of a full year's work will be treated as full time students. In no case will the total fees assessed any special or partial student exceed the total fee for a normal year's work, nor will minimum assessment for tuition for one full course be less than $100.00.

GRADUATE PROGRAMS

Faculty of Graduate Studies:

General Fees

Registration	$10.00
Graduate Students' Association	2.00
Students' Union:	
Associate Membership	5.00
or	
Full Membership (optional at registration only)	27.50
University Athletic Board (optional at registration only)	7.00
Re-admission fee (to be paid by students permitted to resume an interrupted program)	50.00

Instruction Fees

Full-time Students

Except where otherwise noted, each fee quoted in the following schedule is the current total instruction fee for the minimum period during which it is possible to complete the degree program. The University reserves the right to change fees without notice. Students who have not completed their programs when a change is made will pay at the new rate for the balance of their programs.

D.Sc. or D.Litt. degree	$ 390.00
Ph.D. or Ed.D. degree (Holders of Master's degree continuing in the same field) $390.00 a year for two years	780.00
Ph.D. or Ed.D. degree (Holders of Bachelor's degree with honors) $390.00 a year for three years	1,170.00
Master's degrees. Holders of Bachelor's degree with honors or of the B.Sc. degree from a four-year specialized undergraduate program (University of Alberta or equivalent) one year at	390.00
Master's degrees. Holders of any Bachelor's degree from a three-year undergraduate program (University of Alberta or equivalent) $390.00 a year for two years	780.00
Master's degrees. Holders of Bachelor's degrees equated as falling between the two preceding categories will pay one year at $390.00 plus $100.00 for each course above the normal one-year program.	
Master of Education degrees for which residence credit is obtained at Summer Session, three sessions at $195.00 (applicable only to students in Industrial and Vocational Education or others on programs before September, 1962.)	$ 585.00
Subsequent years for all doctoral and master candidates	40.00

Special and provisional graduate students taking courses other than those credited toward a degree program will be assessed $100.00 per full course and $50.00 per half course to a maximum of the fee for a full year's program of senior work in the appropriate faculty.

Part-time Students

Part-time students in all categories will be assessed $100.00 per full course and $50.00 per half course up to the amount of the total instruction fee for the full program. Part-time students shall be subject to an extra assessment of $40.00 for each registration in excess of three. Any outstanding balance will be assessed in the students' final session.

Committee on Degree of Bachelor of Divinity:

Registration ..... $ 5.00

For Summer Session fees, See Summer Session Calendar.

PAYMENT OF FEES

Fees are due and payable immediately after registration. Students at Edmonton may make payments direct to the Cashier in the Administration Building or by mail to the Bursar. During the registration period and up to October 15th, a special deposit box is provided in the lobby of the Administration Building for payment of fees by cheque. Students at Calgary will make payments at Calgary in accordance with such arrangements as are made by the Business Officer. All cheques should be payable at par to University of Alberta.

If fees are to be paid from some form of students' assistance it is the responsibility of the student to so advise the Cashier and (except in the case of Province of Alberta assistance) to produce a letter from the source of the assistance as confirmation. This must be done before the deadline for payment of fees to avoid the penalty. If the assistance is not forthcoming a late payment penalty will be assessed.

Regulations regarding payment of fees:

1. Undergraduate students:
   (a) Fees are due and payable immediately after registration. If desired, payment may be made in two instalments, in which case an additional charge of $3.00 will be added to the second instalment except in the Faculties of Medicine and Dentistry, where the charge will be $5.00. The first instalment consists of full General fees and approximately 60% of the Instruction Fee. (Instalment privileges are not available to students taking less than two full daytime courses.)
   (b) The last date for payment of fees is October 15th. If one is paying in two instalments the late date for payment of the first instalment is October 15th; the second instalment—January 16th. A penalty of $5.00 will be charged on any payment made or postmarked after these dates. In addition, if payment has not been made by October 31st for first-term fees and January 31st for second-term fees, registration will be subject to cancellation and the student to exclusion from classes. A re-assessment of fees will be made to the date of cancellation and the amount unpaid entered on the student's record. Future registrations will not be accepted until the account has been settled.
   (c) Where a student is permitted to register late, the last date for payment of fees will be fifteen days after the date of assessment. A penalty of $5.00 will be charged for any payment after this date.

2. Graduate students:

   The same regulations apply with the following changes:

   (a) The last date for payment of fees is fifteen days after the date of assessment, as shown on the fee card stub.

   (b) Instalment payment privileges are not normally available. However, arrangements can be made with the Fee Clerk in the Bursar's Office to pay in two instalments if the fees exceed $100.00.

3. Extramural students:

   (a) Registration will not be accepted unless accompanied by the registration fee of $2.00 ($10.00 for graduate students) which is not refundable. Full fees are payable on assessment and if not paid as at November 30, registration will be cancelled.

   (b) If notice of withdrawal is received by the Registrar by November 30, all fees except the registration fee will be refunded. If notice of withdrawal is received by the Registrar subsequent to November 30, a *pro rata* charge from October 15 is made and the balance refunded except that no refunds will be made where withdrawal or cancellation is subsequent to March 15.

   (c) A registration may not be carried over from one session to another session. If a student, for any reason not approved by his Dean or Director, fails to write his examination at the regular time, all fees are forfeited, and in order to be admitted to another examination in that course he must register in another session and pay the full fees. When deferred final examinations are granted they must be written at the time of the next regular University examination period.

EXAMINATION FEES

(a) *Final Examinations*: No fee is levied for final examinations written during regular examination periods.

(b) *Supplemental Examinations*: A fee of $10.00 is charged for each supplemental examination written during a regular supplemental examination period.

(c) *Deferred Final Examinations*: A fee of $5.00 is charged for each deferred final written during regular supplemental examination periods. The fee for special deferred finals requiring the setting of special papers is $40.00 per paper.*

(d) *Special Supplemental Examinations*: For special supplemental examinations a fee of $40.00 is charged for each subject.*

(e) *Outside Centres*: An additional fee of $5.00 per subject is charged for writing supplemental examinations in established Alberta centres other than Edmonton.

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*Where the student has been prevented by illness or other extreme circumstance from writing at the regular time, a portion of the fee may be waived.

V—GENERAL REGULATIONS

(a) ACADEMIC REGULATIONS

EXAMINATIONS

Term Examinations

(a) The holding of term examinations is optional with the department concerned.

(b) *Distribution of Credits*: In each course where a final examination is held, credit of not less than 30% and not more than 70% will be assigned to term work. The remaining credit in each course will be assigned to the final examination. At the beginning of the session, announcement will be made by each instructor as to the procedure in each case and the distribution of credit.

(c) *Absence from term examinations or tests*: If a student has an unexcused absence from a term examination or test, the mark assigned to him will be zero. However, in case of illness the student may be excused from writing the examination or test. In applying for exemption a student must present to his instructor an absence slip signed by the Infirmary Physician. When exemption is granted the percentage allotted to the examination or test missed is added to the percentage allotted to the final examination.

(d) *Test Weeks*: Although instructors may give tests at any time at their discretion, one week in the middle of the first term and one week between terms have been set aside as test weeks to assist in scheduling. During these weeks students will not be permitted to leave the campus to engage in extracurricular activities.

Final Examinations

(a) *Final Examinations*: With certain exceptions, a final examination is held in each course. In courses completed in the first term, final examinations may be held either during the test week in January *under departmental supervision*, or at the end of the session, at the discretion of the departments concerned. All other final examinations are held at the end of the session.

(b) *Absence from Final Examinations*: Any student who is ill or suffering from severe domestic affliction is advised not to sit for a final examination. Instead he should advise the Registrar at once of the circumstances and should apply for a deferred final examination to be written at the time of the regular supplementals. Similar action should be taken by any student, who, because of religious convictions or for other cogent reasons, is unable to write a final examination at the scheduled time. Such application will be referred to the student's Dean or Director for a final decision.

If a student becomes ill or receives word of domestic affliction during the course of an examination, he should report at once to the Supervisor, hand in his unfinished paper and request that it be cancelled. Thereafter, if illness is the cause, he must go directly to the Infirmary so that any subsequent application for a deferred examination may be supported by a medical

certificate. The Registrar should be notified of the circumstances in writing within 48 hours of the examination.

In certain cases the decision may be to grant a deferred final examination which will carry with it no supplemental privilege in the event of failure.

Should a student write an examination, hand in his paper for marking, and later report extenuating circumstances to support his request for cancellation of his paper and for another examination, such request will not be entertained.

(c) *Debarment from Final Examination*: A student may be refused permission to write final examinations in a course, on the recommendation of the Department concerned and with the concurrence of the Dean of his Faculty, in the following circumstances:

(i) The student has an inordinate number of unexcused absences.

(ii) The student has neglected to do a substantial proportion of his written assignments in a course of which these are an essential feature.

(iii) The student has neglected to do a substantial portion of the laboratory work in a science course.

(d) *Reappraisal of Final Examination Papers*: Since great care is taken in marking of final examination papers, a student should apply for reappraisal of a paper only if he has good reason to believe that a mistake has been made. Reappraisals are dealt with by the head of the department in consultation with members of the staff. A request for reappraisal must be made by letter to the Registrar (or by completion of an application form in the Registrar's Office) within thirty days after the publication of results, accompanied by a fee of $10.00 for each paper; the fee will be refunded if the grade is raised. It should be understood that if the grade is changed, the new grade, whether higher or lower than the original, replaces it as the student's official grade in the course.

The reappraisal privilege is limited to two papers. Normally there is no such privilege for supplemental examinations.

Students awaiting the outcome of a reappraisal should make application for supplemental examinations by the prescribed deadline.

(e) *Aegrotat Standing*: Aegrotat standing may be granted by the Faculty Council concerned to a student registered in either of the last two years of any course, unless it be in the final year for the first degree in a combined course.

Any student wishing to take advantage of this privilege should apply without delay to the Dean of the faculty concerned. Any other student absent from a final examination because of illness may apply for permission to write the regular supplemental examination (see paragraph (b), above).

(f) *Statement of Record*: After the end of each University session a statement of record is mailed to *each student at the home address specified on his registration.* This should not be expected before June 15.

Supplemental and Deferred Final Examinations

(a) *Supplemental Examinations*: Supplemental examinations are conducted following paragraph). A student granted the privilege of writing supplemental by the University in the week preceding Labor Day (for exceptions, see

examinations must do so at the time of regular supplemental examinations next following or, if given special permission by the Dean, write the regular examinations next following. A student who has failed in a course in the preceding session and who has been granted a supplemental examination should apply to the Registrar not later than the deadline shown in the Academic Schedule, remitting the prescribed fee. The privilege of writing supplemental examinations may be withheld by the Faculty Council if the student's grade point average, including the course or courses failed, is below that required for promotion. Any student who returns to the University, having failed a supplemental examination or having neglected to write it, will be required to repeat the course. In certain cases an equivalent course may be prescribed instead of the failed course. The number of supplemental examinations allowed to any student is determined by the Faculty Council concerned. Notification of permission which may be granted to write one or more supplemental examinations is included in the statement of marks sent to all student.

Supplemental examinations for students in Medicine, Dentistry and Dental Hygiene, and for students proceeding into the second year of Rehabilitation Medicine will be held in the latter part of August. Applications must be submitted to the Registrar at least twenty-one days before the examinations commence.

No application received after the deadline will be accepted.

(b) *Distribution of Credit*: The percentage of term marks carried forward to a supplemental examination will be determined by the Department and Faculty concerned.

(c) *Graduating Students*: The grade point average required for graduation varies in different Faculties. Regulations governing the writing of supplemental examinations to obtain such standing are laid down by these faculties and schools in their own calendars. Subsequent to the degree examinations a member of the graduating class who, having exhausted all the regular supplemental examinations privileges, has still a failure in one course only, may, with permission of the faculty concerned, register in and repeat that course extramurally unless in the opinion of the department concerned a second attendance is necessary. Although supplementals are normally written in the week before Labor Day, a graduating student who is absent on account of illness from, or who fails in, a first term final examination may, with the approval of his Dean or Director, be allowed a supplemental examination during the second term recess in March or at the end of the session; applications for such examination must be made by the deadlines shown in the Academic Schedule.

(d) *Deferred Final Examinations*: A student who has missed a final examination because of illness or domestic affliction or who is obliged to absent himself from an examination for some other compelling reason (including religious convictions) may apply for a deferred final examination to be written at the time of the regular supplemental examinations (see section (b) under Final Examinations). A student in the Faculty of Medicine, Dentistry or Law who cannot take a first term final examination because of illness will be granted a deferred final examination at the end of the session. This regulation also applies to graduating students. (See section (c) above.) Applications for such

examination must be made by the prescribed deadline and must be supported by a satisfactory medical certificate.

(e) *Absence from Supplemental or Deferred Final Examination*: Special supplemental and special deferred final examinations may be granted to students who are prevented by illness (attested by a physican), domestic affliction or other extreme circumstances from writing at the regular time.

(f) *Special Supplemental and Special Deferred Final Examinations*: Special supplemental and special deferred final examinations may be written September 24. In certain approved cases they may be written during the regular examination periods in April, May or August. In each case, application must be made a full month before the examination is to be written.

EXAMINATION RESULTS

After the examination papers have been marked and the final results computed, they must be reviewed by the faculties and recorded in the permanent records before an individual statement can be sent to each student. As this process is time-consuming, students should not expect to receive their statements of marks until about June 15.

DEGREES IN ABSENTIA

Graduands who are unable to be present at Convocation are required to give notice in writing of their intention to be absent. This notice must be received by the Registrar by the date and hour indicated in the Academic Schedule. Any student who fails to give notice as required will be assessed a penalty of $10.00 prior to release of his or her parchment. A graduand may be excused from the payment of this fee if his absence without notice is due to sudden illness, accident, domestic affliction or other reason deemed valid by the Registrar.

GRADING SYSTEM

In the Winter Session of 1966-67 a new nine-point grading system will be introduced, as follows:

9 8	Excellent
7 6	Good
5 4	Pass
3 2 1	Fail

For students proceeding towards an undergraduate degree the minimum passing grade is 4 unless otherwise specified; in courses taken towards a graduate degree the minimum passing grade is 6.

The grading system in use until September 1966 is as follows: 80% and over, Class I; 65%to 79%, Class II; 50% to 64%, Class III. Undergraduate pass mark 50%; Graduate pass mark 65%.

ACADEMIC HONORS

First-Class Standing

First-class standing is a given year is awarded to any student who secures a grade point average of not less than 7.5 in the work of that year.

Degrees With Honors

A student in the Faculty of Arts or of Science with approved qualifications may proceed to the degree of Bachelor of Arts or Bachelor of Science with honors by following a more concentrated course of study in a special field under the supervision of one of the departments. The time required for an honors degree is four years from senior matriculation.

Honors degrees are awarded in two classes, first-class honors and honors. For first-class honors, a grade point average of 7:5 is required; for honors 5.5.

Degrees With Distinction

The notation "With Distinction" is inscribed on the permanent record and graduation parchment of a candidate for any degree, except an Honors or Graduate degree, if the candidate has obtained a grade point average of 7.5 or higher over the last two years of his program.

A student who has taken part of his work at another university may be granted a degree "With Distinction" at the discretion of the Faculty concerned.

RESIDENCE REQUIREMENTS

1. A student proceeding towards a first degree normally must attend at least one academic year as a full-time student.

2. The final year of a degree program normally must be taken on the campus of the University of Alberta.

3. If the student has fulfilled the requirement outlined in (1) above before beginning the final year of his program, he may seek to fulfil the second requirement by attendance at Summer Session or in the Evening Credit Program of the University.

PROMOTION REGULATIONS

Full details of special promotion regulations of the various faculties and schools will be found in pages relating to the faculty or school.

UNSATISFACTORY STANDING

A freshman student whose matriculation record is weak may be warned of this fact at the outset of the session.

The records of all students in the University are reviewed at the end of each session. A student whose record is then unsatisfactory will be notified by his Dean or Director and will be referred to Student Counselling Services for recounselling. He may be denied supplemental examinations and may be required to repeat his year.

A student whose record is extremely unsatisfactory may be required to withdraw from the University and in any event will not be permitted to

re-enter without re-counselling. Such a student who seeks re-admission to the University must report his intention by letter or in person to the Director, Student Counselling Services, not later than August 1st

A student with an extremely unsatisfactory record at another University will not be considered for admission until at least a year has elapsed from the date of his leaving that institution. Thereafter, the procedure outlined above will apply.

The General Faculty Council may refuse permission to a student or prospective student to enter any year of any course if, in the opinion of the Council, the student shows a lack of general educational attainment. Further, a student whose record in the classroom, in tests, or in final examinations is unsatisfactory, may at any time be required to withdraw from the University.

RELATION OF SCHOLASTIC STANDING TO EXTRACURRICULAR ACTIVITIES

To be eligible (1) to represent the University in any competition with outside organizations, (2) to participate in non-competitive University activities which are open to the general public, or (3) to hold office in a student organization, a student must be a bona-fide student, and meet the requirements of *satisfactory scholastic standing.*

Bona-fide students are:

(i) students doing full-time undergraduate work in the University; or

(ii) graduate students in attendance carrying a full year's work leading to a degree; or

(iii) students in affiliated colleges carrying a full year's work leading to a diploma or certificate and taking two full courses of University grade in the University.

Bona-fide students may assume that they are scholastically eligible to participate in the activities listed above unless they are informed otherwise by their Deans or Directors. However, men students desiring to participate in events sponsored by the Western Canadian Intercollegiate Athletic Union, must meet the requirements of scholastic standing laid down by that body.

If a student feels at any time that there are circumstances which might have a bearing on his eligibity to participate, he should consult the Dean of his faculty or the Director of his school as soon as possible and explain these circumstances to him.

APPEALS

A student may present an appeal to the respective Council or Administrative Committee concerned through the Dean or Director.

The General Faculty Council has power to hear and determine appeals from the decisions of the Faculty Councils upon application by members or by students and others. Such appeals should be addressed to the Registrar, Secretary of the General Faculty Council.

STUDENT GRIEVANCES

Student grievances of an academic nature sometimes arise. Such complaints should be directed primarily to the Professors concerned. Normally, satisfaction will be obtained. However, recourse is available to Department

Heads, Deans, and the President, in that order. In appropriate cases the Department Head or Dean may refer the matter to the Faculty Council, from which an appeal may be taken to the General Faculty Council. Complaints may affect the student as an individual or as a member of a class. Where it appears the class as a whole is affected, the student should try to determine class feelings before making any formal complaint. The academic staff is willing to help students and discuss their academic problems.

(b) ATTENDANCE AND CONDUCT

ATTENDANCE

(a) Regular attendance is expected of students in all courses. At the recommendation of the Department concerned, and with the concurrence of his Dean, any student having an inordinate number of unexcused absences from a course may be refused permission to take the final examination.

(b) Absences are counted from the first day of the session.

(c) Students who are late for any lecture or laboratory period will be marked absent unless at the end of the period in question they account satisfactorily to the instructor for their lateness.

(d) Illness and Physical Disability:

(1) Students who are absent from two or more consecutive classes in a course because of illness or disability should report the reason to their instructor upon their return to class.

(2) Absence from term or final examinations—see EXAMINATIONS.

(e) Students who are absent from two or more consecutive classes in a course for some valid reason other than illness should report to their instructor upon their return to class. If the instructor requires an absence slip, it will be the student's responsibility to have one signed by the Registrar and to show it to the instructor.

(f) Students desiring leave of absence in any given course must communicate their desire to the Registrar. At the end of such a period of absence, the student must present an absence slip for the Registrar's signature.

STUDENT CONDUCT AND DISCIPLINE

When a student enters the University, it is expected that he will apply himself to his studies and conduct himself with propriety. Should a student fail to live up to these expectations, the University reserves the right to take such action as ,in its opinion, his case warrants. The penalty of expulsion may be applied.

1—Deans' Council

The day-to-day administration of student discipline has since 1942 been vested in the Deans' Council, and in those persons and bodies to which its authority has been delegated.

2—The Provost, the Dean of Women, and the Dean of Men

The Provost of the University exercises general supervision over the conduct and welfare of the students. He is Secretary of the Deans' Council and Chairman of the Committee on Student Affairs. and of the General Residence Com-

mittee. He works in cooperation with the Dean of Women and the Dean of Men.

3—The Disciplinary Committee of the Students' Union

The Students' Union is concerned with all matters of discipline and is, as a matter of policy, given the first opportunity to deal with any disciplinary issue that may arise. For this purpose it has set up a Disciplinary Committee.

4—The Wardens and the General Residence Committee

The Residence Wardens are staff members appointed by the Board of Governors. In conjunction with the General Residence Committee, they are responsible for student discipline within the residences.

SPECIAL REGULATIONS OF THE BOARD OF GOVERNORS

(a) All interference on the part of any student with the personal liberty of another or any conduct on the part of any student subjecting another student to any indignity or personal violence is forbidden. No initiation ceremony involving physical violence, hazing, personal indignity, interference with personal liberty or destruction of property may be held within the buildings or on the grounds of the University, such student activities being expressly forbidden under penalty of suspension or expulsion.

The University authorities will not be responsible for any accident or illness of any kind occasioned to any student while engaged in or being subjected to any such activities.

(b) In the case of dishonesty or any serious indiscipline in the classroom, the instructor has the authority of suspension from the classroom. Further action is to be taken by a committee consisting of the Provost and the department and Dean concerned.

(c) The use of, bringing or having of liquor on University premises, including residences, is strictly prohibited.

(d) The Board of Governors considers the raiding or unlawful entry of residences as a very grave offence. Any such occurrence will be reported to and dealt with by the Board.

VI—STUDENT SERVICES AND STUDENT AFFAIRS

STUDENT COUNSELLING SERVICES

Counselling is available throughout the year to university students and to prospective university students.

Prospective students may be counselled during their Grade XII year or afterwards. It is necessary to make an appointment in advance. Counselling will be provided in matters of vocational and program choice. The booklet "Information for Prospective University Students" has been prepared in order to answer questions that are commonly asked.

University students may use the service in matters of program choice, vocational planning, progress with studies, and personal concerns. Vocational

testing is available. Other testing is also available at the discretion of a counsellor. Some of the services are as follow:

(1) *Study Skills.* A series of tutorials is arranged during the session. Individual counselling is also available.

(2) *Vocational Planning.* A counsellor may be consulted about future plans, including further professional training.

(3) *Personal problems.* Sometimes a student's performance suffers because of worry, restlessness, inability to concentrate, or preoccupation with personal problems. In such circumstances counselling should be sought.

(4) *Change of Faculty.* Students contemplating a change of faculty may consult a counsellor. During the summer recess such action should be taken as long as is possible prior to the opening of the session.

(5) *Withdrawal from the University.* Any student who, for any reason, is contemplating withdrawal should arrange for an interview with a counsellor, and subsequently with his Dean or Director.

(6) *Unsatisfactory Standing.* Counselling is advised and, in cases of extremely poor standing, is required by the Faculty Council concerned. See UNSATISFACTORY STANDING.

Address enquiries to Student Counselling Services, University of Alberta, Edmonton. The office is located in the Education Building on the campus; telephone 439-8721, extension 772.

STUDENT HEALTH SERVICES

A Student Health Services budget is maintained in Edmonton by an annual appropriation from revenue. This budget is administered by a committee consisting of a Chairman from a University Faculty, the Medical Director, the Assistant Medical Director, the Student Health Service Physician, the Dean of the Faculty of Medicine, the Bursar, the Director of Student Counselling Services, the President of the Students' Union, the President of the Wauneita Society, the Treasurer of the Students' Union and the Chairman of one House Committee. All full-time students are entitled to medical treatment under such conditions and provisions as are outlined in the Student Health Service brochure which is supplied to all students. This brochure should be read carefully.

PHYSICAL EDUCATION SERVICE PROGRAM

It is the aim of the Faculty of Physical Education to make a major contribution toward the physical, mental and social life of each student through instruction and participation in physical and recreational activities.

All first-year students are required to take two hours of physical education per week. Those excepted from this regulation are:

1. students declared physically unfit by the University Health Services;
2. students over 25 years of age.

Students in these categories must register with the Faculty of Physical Education.

Individual lockers, locks, towels and shower facilities are available for all students. The program is conducted in the Physical Education Building.

The prescribed gymnasium costume is:

Women:	*Men:*
Shorts (dark green)	Shorts
T-shirt (white)	T-shirt
Socks (white)	Socks (White)
Running shoes (white)	Running shoes

Shorts and T-shirts may be purchased at the University Bookstore.

NATIONAL EMPLOYMENT SERVICE STUDENT PLACEMENT

The National Employment Service Office on the main floor of the Administration Building at Edmonton is operated to help students find permanent or summer jobs. The Office is happy to advise or assist students at any time without obligation. Students who wish summer jobs are advised to register well before the end of the spring term. Those graduating should register at the beginning of the year because employer interviews begin in the early fall and continue throughout the session.

RESIDENCES

Residential accommodation is provided in the present University Residence Halls for approximately 1,500 students. Applications for reservations, accompanied by thirty dollars ($30.00), should be forwarded to the Housing Office, Lister Hall. Reservations will not be held after the respective dates of registration.

Students who make application for and are assigned rooms must understand that they are in fact agreeing to remain in residence for the full academic session.

Charges for Room and Board will be made at the following rates:

	Single Room	Double Room
Monthly charge	$90.00	$82.00
Daily rate (used for fractional periods)	3.05	2.80

Students leaving during the Christmas holidays will receive a rebate of $1.00 per day for board for each day's absence during the official vacation period. This amount will be credited to the respective room and board accounts.

Payment of room and board charges is due on or before the first day of each month. A penalty of 50c per day to a maximum of $5.00 per month will be assessed on any arrears after the tenth day of the month.

A limited amount of accommodation is available in St. Stephen's College and St. Joseph's College. Details can be secured by writing directly to the colleges.

The University reserves the right to change the above regulations, payment schedules and rates without notice.

STUDENT HOUSING SERVICE

While University authorities cannot accept responsibility for finding suitable accommodation they provide a special *listing* service for the benefit of out-of-town students. *Student Housing Service* prepares lists of rooms prior to the summer session and to the regular sessions and these lists may be consulted by students looking for such accommodation. The service operates as a part of the Housing and Food Services and is located in Lister Hall. The housing phone is 433-1187.

Lister Hall provides a full meals and restaurant service for the convenience of students, and in addition the University Cafeteria and the Snack Bar in the Students' Union Building in Edmonton are open during hours adapted to their needs.

STUDENT AWARDS

The Administrator is Mr. R. B. Wishart. His office is on the second floor of the Administration Building, and his telephone number is 439-8721, Extension 495. He administers not only University awards but also those made under the Students Assistance Act and the Canada Student Loans Plan. For further information, see the Awards Section of the Calendar.

THE BOOKSTORE

For the convenience of students, the University maintains a bookstore where textbooks prescribed in the university calendar may be obtained. Stationery, drawing materials, gymnasium wear and other accessories are also available at special student prices.

STUDENT GOVERNMENT

A long-standing duty and prerogative of the University Senate has been to make provision for student self-government on the campus.

To this end it established a Committee on Student Affairs in 1911.

The Committee on Student Affairs ratifies the Constitution of the Students' Union and receives twice yearly reports on the Union's activities. All registered students become members of the Students' Union on payment of their general fees.

Besides authorizing the activities of the Students' Union, the Committee on Student Affairs interests itself in student extracurricular life in general.

Students in residence elect members to a General Residence Committee with subcommittees for matters relating solely to the men and women students. Originally under the direct control of the Board of Governors, the General Residence Committee has since 1942 been a standing committee appointed by the Deans' Council.

THE INTRAMURAL SPORTS PROGRAM

The Faculty of Physical Education, with the cooperation of the University Athletic Board, organizes and administers a comprehensive program of intramural sports. A primary purpose of the program is to encourage sportsmanship and friendly relations among the students of the University through athletic competition. Individual and group competitive sports for men and women include tennis, golf, track and field, cross-country running, basketball, hockey, volleyball, touch football, table tennis, swimming and figure skating. Facilities include gymnasium, swimming pool, ice arena and outdoor playing fields.

INTERCOLLEGIATE ATHLETICS

As a member of the Western Canada Intercollegiate Athletic Association, the University provides opportunities for men and women to compete in intercollegiate sports. Included in the activities for men are golf, tennis, cross-country, badminton, volleyball, basketball, football, hockey, wrestling, swimming

and curling. Women compete in tennis, golf and badminton and hold two sports weekends with member universities. Basketball and curling are played during one weekend and volleyball, swimming and figure skating during the other.

UNIVERSITY RESERVE UNITS

General

The University Reserve Units are organized as sub-components of the Reserves of the three Services as follows:

(a) Royal Canadian Navy—University Naval Training Division (UNTD)
(b) Canadian Army—Canadian Officers Training Corps (COTC);
(c) Royal Canadian Air Force—University Reserve Training Plan (URTP).

Role

The role of the University Reserve Units is:

(a) To introduce the university undergraduates to service life so that they may make an intelligent appraisal of the advantages of a service career in one of the Regular Forces;

(b) To provide selected university undergraduates with the training necessary to qualify them for commissioned rank in the Regular or Reserve forces; and

(c) To engender in university undergraduates an awareness of the needs, problems and responsibilities of the Armed Forces of Canada, and an understanding of their role.

Training

The normal training programme is divided into two theoretical and two practical phases. Selected officers of each Service will be given a third theoretical and practical phase of training. Each theoretical phase consists of 64 hours of instruction at the university during the academic year. The practical phases each consist of from 12 weeks to 15 weeks of training taken at a service school or unit of the Regular Force. This practical training in interesting fields will reinforce certain university courses and, in some cases, credits are obtained to meet university requirements.

During summer training the undergraduate receives Regular Force pay. Transportation, uniforms, meals, and accommodation are provided as prescribed for officers of the Regular Forces. The officer cadet also receives medical and dental care while on summer training. During the university year, undergraduates may earn up to 16 days' pay for training completed.

Commissioning

Upon successful completion of training, cadets are commissioned, and may be considered for service in the Regular Forces, or the Reserves.

FINANCIAL ASSISTANCE

For the Regular Officer Training Plan and the Medical and Dental Corps Subsidization Plans, students are referred to the chapter on Academic Awards and Financial Assistance.

VII

The Faculty of Agriculture

INFORMATION, REGULATIONS, COURSES

INTRODUCTION

The Faculty of Agriculture was established at the University of Alberta in 1915 and the first students to receive the degree of Bachelor of Science in Agriculture (B.S.A.) graduated in 1918. The present B.Sc. degree was first given in 1924.

The four-year course in Agriculture provides education in the science of agriculture. The Faculty has under its direct administration the departments of Agricultural Economics and Farm Management, Agricultural Engineering, Animal Science, Dairy and Food Science, Entomology, Plant Science and Soil Science. The Department of Genetics is jointly administered by the Faculties of Agriculture and Science. Many of the courses which are fundamental to the science of agriculture are given in other departments of the University, since the underlying scientific principles are the same as in any other field. It is the function of the departments in this Faculty to apply these principles to the solution of agricultural problems and to seek, through research, new information.

Graduates of the Faculty are engaged in teaching, research, extension, and administrative work related to agricultural production, marketing, and processing; in the manufacture and distribution of such essentials as feeds, fertilizers, and machinery; in the handling of agricultural products; and in farming. In recent years an increasing number of agricultural industries have offered attractive opportunities for graduates of this Faculty.

The departments in the Faculty also offer advanced degrees, and carry on extensive programs of research. The departments of Animal Science, Plant Science, and Soil Science operate experimental farms used in the teaching and research programs of these departments. All departments have space and facilities for laboratory research.

A modified first year in Agriculture may be taken at the University of Calgary by registering in the program listed later in this calendar. A rather similar modified program is also offered at affiliated Junior Colleges. The second, third and fourth years in Agriculture are offered at the University of Alberta only.

Two years of Pre-Veterinary Medicine may be taken at the University of Alberta with a view to applying for admission to the four year program in Veterinary Medicine at the University of Saskatchewan, Saskatoon. (See Special Program.)

Student Guidance

The Dean of the Faculty of Agriculture will be pleased to confer with students at any time.

Students of the second, third and fourth years will be assisted and guided in connection with their registrations by members of the Agricultural Registration Committee.

ADMISSION

Matriculation Requirements

Students from the high schools of Alberta seeking admission to the Faculty of Agriculture will be required to present either—

I.—The High School diploma with "B" or higher standing in the following courses and an average in them of at least 60.0%:

1. English 30.
2. Social Studies 30.
3. Mathematics 30.
4. 5. and 6. Three of: Biology 30*
   Chemistry 30**
   Physics 30
   French 30, or German 30, or Latin 30, or Ukrainian 30 or another language at an equivalent level.

or

II.—A diploma from an Alberta Agricultural and Vocational College, together with "B" or higher standing in Literature 20; Language 20; Social Studies 20; Mathematics 30; and two of Biology 30 (or Biology 32*), Chemistry 30**, or Physics 30; with an average in the three Grade XII courses of at least 60.0%.

It is advantageous to have Mathematics 31 also.

Students who completed Grade XII in 1954 or earlier will be given full consideration for admission. They are advised to write to or to see the Registrar of the University and to provide a complete transcript of their high school records.

Candidates from outside Alberta will be required to meet equivalent standards.

These general regulations notwithstanding, the University may in its discretion refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements at the University of Alberta.

PROMOTION

1. Inasmuch as a rigid year system is not followed in the Faculty of Agriculture, promotion from year to year is made by Faculty Council upon the recommendation of the Agricultural Revisions Committee.
2. In general, promotion to the third year in Agriculture will be granted only to students who have passed all first and second year subjects required; it may also be granted when a student has passed, in the first two years, nine full courses or equivalent and has attained an average in them of at least 60.0%.

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*Biology 32 will be accepted if taken before September, 1965. Students offering that course will be required to take Biology 130 in their first year.

**Chemistry 30 was previously required. Any student not offering this course will be required to take Chemistry 130 as well as Chemistry 230.

3. Students transferring from other universities normally will be required to take, as a minimum, the equivalent of a regular senior year in attendance at the University of Alberta before the degree of B.Sc. in Agriculture will be granted.

The attention of students in Agriculture is directed to the fact that admission to postgraduate studies leading to the M.Sc or Ph.D. degrees is based primarily upon the quality of the undergraduate work.

PROGRAMS OF STUDY

The Degree of B.Sc. In Agriculture

In the Faculty of Agriculture, courses are offered leading to the degree of B.Sc. in Agriculture.

Most of the first year program in Agriculture consists of courses required of all students. There are also some course areas required of all students during the second year but students may select courses of their own choice. Thus students have the opportunity to commence specialization in one of several branches of professional agriculture, or they may continue on a general program of courses in the second year. During the third and fourth years students have great freedom in the selection of the courses which they take.

The Faculty of Agriculture may for adequate reasons permit students to register in more or fewer courses per academic year than set forth below. This may result in decreasing or increasing the length of time to graduation.

Requirements for the B.Sc. degree in Agriculture for general and specialist programs follow.

Courses Required in the First Year

(1) Agriculture 202 (2-0; 0-0)

(2) Agriculture 203 (0-0; 2-0)

(3) **Either** Biology 130 (for those lacking Biology 30)
Or an approved option. (3-3; 3-3)

(4) **Either** Chemistry 130 (for those lacking Chemistry 30)
Or Chemistry 230 (3-3; 3-3)

(5) Economics 200 (3-0; 3-0)

(6) English 210 (3-0; 3-0)

(7) Mathematics 240 (3-1; 0-0) Statistics 241 (0-0; 3-1)

(8) Physical Education 218 (or 228) (0-2; 0-2)

Courses Required in the First or Second Year

(1) One of the following: Entomology 201; Genetics 351; Microbiology 360; Entomology 200 and Genetics 360; Microbiology 201 and Genetics 360.

(2) Two of: Chemistry 350; a mathematical subject; Physics 100 or 200; an approved social science; an approved biological science.

(3) A full course or equivalent in an agricultural department.

(4) An approved elective.

(5) Additional course(s) as necessary to give a minimum of ten full courses or equivalent in addition to Agriculture 202 and 203 during the first two years.

Modified First Year at the University of Calgary
(and at affiliated Junior Colleges which follow its programs)

At the University of Calgary, students may take a substantially modified first year Agriculture programme which reduces the opportunity to take elective courses in the second year. The second, third and fourth years of Agriculture are offered only at the University of Alberta. The modified first year programme in Agriculture at the University of Calgary follows:

1. Physical Education 218 or 228
2. Economics 200 and English 240
3. Three full courses or equivalent from among:

Preferred courses:

Biology 200*
Chemistry 230 or 250
Mathematics 211

Alternative courses (not more than two may be offered)

Business 201	Philosophy 241
Chemistry 250	Sociology 202
Geography 201	Political Science 200
Geology 201	A second language
Physics 100 or 200	

NOTE: Students who take the modified first year at the University of Calgary must complete the Faculty of Agriculture requirements of the first two years, during their second year which is taken at Edmonton. In addition to Agriculture 202 and 203, which are attendance but not examination courses, students from Calgary will take the following courses unless equivalent credit is presented: Biology 130 (Biology 30 or 200 acceptable equivalents); Chemistry 230 (Chemistry 230 is equivalent); Mathematics 240 and Statistics 241 (Mathematics 201 or 211 accepted as equivalent).

Other Requirements

1. After successful completion of the requirements of the first and second years students must complete a minimum of ten full courses or equivalent in addition to Agriculture 451, which is required in the fourth year.
2. A mid-September field trip of approximately one week, that normally will be taken prior to registration for work of the third or fourth year and at the student's expense, is a requirement for graduation unless a student has been specifically exempted from this requirement. Details are provided to the students concerned in March or April each year. Applications for exemption should be made as early as possible and in any case should reach the Dean's Office not later than August 20.
3. Commencing in the second year students may follow a general program designed to provide a broad training in agriculture or they may begin specialization in one of several fields.

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*Students having credit for Biology 30 may not offer this course at the University of Alberta as one of the five courses for transfer credit.

(a) Students not following a program of specialization must take courses in at least six Faculty of Agriculture departments and they must take at least twelve half courses or equivalent in those departments.
Programs must be approved by the Registration Committee.

(b) Students following programs of specialization must meet a minimum of three Faculty of Agriculture departments in addition to the one in which they are specializing and they must take at least six half courses in the Faculty of Agriculture departments other than their department of specialization.
Programs must be approved by the Registration Committee.

4. Normally, fourth year students having advance senior credit must register for a program of five full courses or equivalent including "extras". Students may, under advice, register for additional courses up to a maximum of six full courses or equivalent in any one year. This total may not be exceeded except by special permission of the Dean of the Faculty.

In order to exclude courses in excess of the minimum requirement from the contract for graduation, the student must designate such courses as "extras" at the time of registration for the final year.

5. **Changes in registration can be made only by arrangement with the Dean or Registration Committee before December 1 in the case of first-term Courses, or before March 1 in the case of second-term or full-year courses.**

ACADEMIC STANDING REQUIRED FOR GRADUATION

1. After the requirements of the first two years have been met, students must obtain a passing mark or better in 10 full courses or equivalent and obtain a grade point average of 5.0 in those courses.
2. A student will not be allowed to write more than the equivalent of three full course supplemental examinations whether for the purpose of obtaining passing marks or of raising his average to the required level.
3. A student will not be allowed to write more than the equivalent of two full course supplemental examinations in any year.
4. A student who is repeating a year will be granted no supplemental privileges in the courses taken that year and must pass all courses with a grade point average of 5.0 to be allowed to continue.
5. The privilege of repeating a year will be granted to a student not more than once during his candidacy for a degree in this Faculty, unless by special permission of the Faculty of Agriculture Council.

Attention is directed to the regulation that a student is responsible for the completeness and accuracy of his registration.

Preferred Second Year Electives for Specialization in Various Departments

Agricultural Economics	Agricultural Engineering	Animal Science	Dairy and Food Science
See Agricultural Economics	Ag. Eng. 200 Ag.Ec. 367 or 368	Micrb. 201, Gen. 360 Biol. 230 Chem. 350	See Dairy and Food Science

Entomology	Genetics	Plant Science	Soil Science
None Specified	Genetics 351 or Micrb. 201 and Genetics 360	Micrb. 201 and Genetics 360 Biol. 230	Micrb. 360 Soil Sci. 240 and 250

Third and Fourth Years

The general requirements for the various programs of specialization are given in the following sections. Students entering the third year must consult the departments in which they plan to specialize and it is highly desirable to work out a tentative program for both the third and fourth years. All programs of specialization must be approved by the Departments concerned and must be acceptable to the Registration Committee.

Students planning to follow the general program should consult the Registration Committee to obtain approval of the programs which they plan to follow.

Department of Agricultural Economics

The department offers programs in General Agricultural Economics, Agricultural Business, Farm and Ranch Management, and Rural Social and Economic Development. Any of these programs may be taken jointly with a major or minor in certain other departments. Further information on these programs may be obtained from the department.

Second year preferred electives: Agricultural Economics 367; Economics 300 or 301; an approved mathematics or statistics course; Rural Sociology 300 and 356.

Third and fourth years: Students should consult the department respecting their course programs.

Department of Agricultural Engineering

Agricultural Mechanization

Third and Fourth Years: An approved course in mathematics; one of Business 202, Business 300, Agricultural Economics 422 and 423; Agricultural Engineering 401; four of Agricultural Engineering 301, 302, 303, 304, 305, 340 and 407. Electives to a minimum of five full courses per year.

Department of Animal Science

The courses listed below, plus approved electives to a minimum of 5 full courses per year, are recommended for most students. Normally electives should include sequences of two half-courses in the agricultural engineering, soil and plant science areas. Those who desire more specialized programs or who anticipate proceeding to graduate study are urged to consult the head of the department to consider alternative program outlines; Biochemistry 300 and Biometrics 455 are strongly recommended for these students. Dairy and Food Science 241, 466, 476 and one of 353 or 490 are required courses for a minor in Dairy Science.

Animal or Poultry Science

Third Year: Animal Science 300, 310, 370, Poultry Science 352, Veterinary Science 300, Agricultural Economics 362 or 367 and 368.

Animal Science

Fourth Year: Animal Science 468, 469, 484, 485, Poultry Science 455.

Poultry Science

Fourth Year: Animal Science 468, Poultry Science 453, 455, 459, 460.

Department of Dairy and Food Science

A general program is offered by the department and it requires the following minimum courses (pre-requisites are *italicized*):

Second Year: *Microbiology 360;* Milk Production 241 (or suitable alternative).

Third Year: *Biochemistry 300* OR *Plant Physiology and Biochemistry 431, 432;* Food Chemistry 475; Dairy Chemistry 476; Food Microbiology 465; Principles of Food Processing 352.

Fourth Year: Dairy Microbiology 466; Dairy Processing 353.

Modifications or additional courses in Dairy and Food Science may be taken to suit individual students' requirements and to meet timetabling difficulties, subject only to normal Faculty requirements.

A double major in Dairy or Food Science can be taken in conjunction with any other major program subject to the approval of the head of the other department or, subject to the aprpoval of the Dean, in conjunction with a General Program.

For further information and detailed course description, contact the department.

Department of Entomology

Third and Fourth Years: Students wishing to specialize in entomology should consult with the head of the department respecting their course programs. The department is active in behavior, ecology, morphology, physiology, taxonomy and toxicology of insects.

Department of Genetics

Third and Fourth Years: Students wishing to specialize in Genetics or in Field Crops and Plant Breeding should consult with the head of the department respecting their course programs. The department is active in cytology, cytogenetics, microbial genetics, biochemical genetics, biometrical genetics, radiation genetics, genetics of parasitism, field crops and plant breeding.

Department of Plant Science

The Department of Plant Science is composed of the following divisions:

Horticulture	Plant Physiology and Biochemistry
Plant Pathology	Weed Science and Crop Ecology

Students interested in a program in general plant science or in specialization in a particular field of study should consult with the head of the department or with staff members in charge of the various divisions.

For students majoring in plant physiology and biochemistry recommended courses include Plant Physiology and Biochemistry 431 and 432, Physics 240, Chemistry 312, Chemistry 370 and Botany 320.

Departments of Genetics and Plant Science

Students wishing to major in Plant Breeding and Plant Pathology as a combined program are advised to consult the head of the department of Genetics or of Plant Science.

Department of Soil Science

Soil chemistry, soil fertility, soil genesis and classification, soil microbiology, soil physics, and soil conservation.

Third and Fourth Years: Soil Science 420, 430, 450, 460, 480 and either Biometrics 455 or Geology 202 plus electives to meet requirements for degree in specialized programs. Soil Science 470 is optional.

Consult the Department for a detailed listing of the courses in the other Agricultural Departments and in other Faculties acceptable as electives for specialization in Soil Science.

SPECIAL PROGRAM OF PRE-VETERINARY MEDICINE

Facilities at the Ontario Veterinary College are very limited, and because of the great current interest in veterinary medicine, few if any students from Alberta are likely to be admitted to that institution, with or without advanced standing.

A new College of Veterinary Medicine has been established at the University of Saskatchewan, Saskatoon. The program consists of two years of Pre-Veterinary Medicine and four years of Veterinary Medicine. Alberta residents hoping to take Veterinary Medicine at the University of Saskatchewan may take the two Pre-Veterinary years at the University of Alberta, Edmonton.

It is probable that there will be a quota on Alberta students entering Veterinary Medicine at the University of Saskatchewan and that those students with the highest standing in the work of the two Pre-Veterinary years will receive preference. In fact all students considering veterinary medicine should know that there is such keen competition for admission to schools of veterinary medicine that a superior academic record is likely to be a requirement to win one of the limited number of places available anywhere.

Admission

Students in the Pre-Veterinary Medicine Program at the University of Alberta are registered in the Faculty of Agriculture.

The admission requirements which are specified by the University of Saskatchewan are:

The High School Diploma with "B" or higher standing in the following courses and an average in them of at least 60.0%.

1. Chemistry 30
2. English 30
3. French 30, German 30, or Latin 30
4. Mathematics 30
5. Social Studies 30
6. Biology 30 or Physics 30

Pre-Veterinary Medicine Program

First Year

Agriculture 202 (2-0; 0-0)*
Agriculture 203 (0-0; 2-0)*
Biology 130 or 230 (3-3; 3-3)
Chemistry 230 (4-3; 4-3)
English 210 (3-0; 3-0)
Mathematics 240 (3-1; 0-0)
Statistics 241 (0-0; 3-1)
Physics 100 (3-3; 3-3) or an elective
Physical Education (0-2; 0-2)

Second Year

Biology 230 (3-3; 3-3) or Zoology 320
Chemistry 350 (3-3; 3-3)
Economics 200 (3-0; 3-0)
Genetics 351 (3-3; 3-3)
Physics 200 (3-3; 3-3)

Note: Students successfully completing the two years of Pre-Veterinary Medicine may apply to transfer to the program in Agriculture with the opportunity to earn the B.Sc. in Agriculture by the successful completion of two additional years of work with satisfactory standing.

Correspondence regarding the Pre-Veterinary Medicine Program should be addressed to:

The Dean, Faculty of Agriculture
University of Alberta, Edmonton.

GRADUATE STUDIES

Programs leading to advanced degrees (M.Sc. and Ph.D.) are offered by the Departments of Agricultural Economics, Agricultural Engineering, Animal Science, Dairy and Food Science, Entomology, Genetics, Plant Science, and Soil Science. Course programs and thesis projects are arranged in consultation with members of the departmental staffs.

General information concerning the Faculty of Graduate Studies and details concerning admission, fees, etc., are given in the special calendar for that Faculty. Information on requirements and opportunities in specific fields of work may be obtained from the appropriate department.

DETAILS OF COURSES

The courses offered by the Faculty of Agriculture are listed below.

Courses numbered 100 to 299 inclusive, described as junior, are open to first-year students and are also available as options in senior years of certain patterns. Courses numbered 300 to 499, described as senior and graduate, are designed primarily for students beyond the first year at University. Those numbered 500 or higher are open mainly to honors and graduate students. For further information, particularly in the matter of prerequisites, students are advised to consult the section of the calendar containing detailed descriptions of courses.

NOTE: The hours of instruction per week for both terms are shown at the top of each course description. The letter "L" attached to a figure signifies lecture-laboratory-hours, the letter "P", project-hours, and the letter "S" seminar-hours. Unless otherwise specified, the first figure in each term indicates lecture-hours and the second laboratory-hours.

*These are attendance courses which do not have examinations.

AGRICULTURE

Agric 202. (2-0; 0-0)

Introduction to Agriculture—An orientation course dealing with the development, role, scope, application, current thought and practices of the major areas of scientific agriculture.

Agric 203. (0-0; 2-0)

Public Speaking—A series of lectures on essentials and procedures in public speaking. The development of confidence before audiences by student participation in the preparation and presentation of short talks.

Agric 451. (1-0; 1-0)

Practical and Professional Agriculture—The present status of practical and professional agriculture. Agricultural organizations in the business and professional fields. Employment opportunities. General knowledge.

AGRICULTURAL ECONOMICS

STAFF:—

Professor and Head—T. W. Manning

Professor—H. C. Love

Associate Professors—E. R. Berg, W. B. Rogers, W. M. Schultz, G. R. Winter

Assistant Professors—L. P. Apedaile, C. A. S. Hynam, A. A. Warrack

AgEc 315. (0-0; 3-3)

Statistical Analysis—Basic and secondary sources of economic data relating to agricultural production, processing, and marketing; their collection, analysis, and presentation.

Prerequisite: Stat 305.

AgEc 362. (3-3; 3-3)

Farm and Ranch Management—The organization and management of farm business. Farm records, budgets, acquisition of land and capital. Introduction to linear programming of farm plans.

AgEc 364. (3-3; 0-0)

Agricultural Market Organization—The organization, functions, and agencies of agricultural markets; field trips and case studies of marketing agencies and individual commodities.

Prerequisite: Econ 200; AgEc 367.

AgEc 367. (3-0; 0-0)

Economics of Agriculture—An introduction to the nature and scope of agricultural economics; economic aspects of agricultural production, marketing, finance, resource use, prices, and policy; relation of the agricultural sector to the economy as a whole; analysis of structural change, economic growth and adjustment in agriculture.

Prerequisite: Econ 200 or 302.

Note: This course is the same as Econ 367. Not open to students who have credit for that course or AgEc 303.

AgEc 368. (0-0; 3-0)

Economics of World Agriculture—A survey of the world structure of agricultural production, consumption, and trade; international agricultural policies and agreements; impact of regional economic integration on agriculture, interrelation of economic development and trade in agricultural commodities.

Prerequisite: Econ 200 or 302.

Note: This course is the same as Econ 368. Not open to students who have credit for that course.

AgEc 385. (0-0; 3-3)

Agricultural Prices—Price determination, market price discovery, futures prices, and price behaviour over time; exercises in statistical price analysis.

Prerequisite: AgEc 315,and 364 or 367.

AgEc 400.

Special Topics—Library or field study of a selected topic or problem requiring both written and oral reports. Credit up to a maximum of three credit hours.

Prerequisite: Consent of the department.

AgEc 415. (3-3; 0-0)

Analytical Methods in Agricultural Economics—Uses of mathematical models, probability theory, and statistical inference in agricultural economics research and analysis.

Prerequisite: AgEc 315, Econ 300 or 301.

AgEc 422. (3-0; 0-0)

Managerial Economics for Agricultural Businesses—The role of management in farm supply, service and distribution businesses; economics of managerial decisions.

Prerequisite: AgEc 367, Econ 300 or 301.

AgEc 423. (0-0; 3-0)

Management Techniques in Agriculture—The application of decision-making techniques to the management of agricultural businesses.

Prerequisite: AgEc 422.

AgEc 443. (3-0; 0-0)

Agricultural Finance—Capital requirements in agriculture; principles of financial management; the farm credit market; credit institutions.

Prerequisite: AgEc 362 or 367.

AgEc 453. (0-0; 3-0)

Land Economics—Principles of land use, population pressures, resource conservation, theory of rent, farm tenure and appraisal.

Prerequisite: AgEc 362 or 367; Econ 300 or 301.

AgEc 463. (0-0; 3-0)

Agricultural Marketing Economics—Economic aspects of agricultural markets; location of market activity; market structure and performance.

Prerequisites: AgEc 364, Econ 300 or 301.

AgEc 473. (3-0; 0-0)or(0-0; 3-0)
Agricultural Policy—Economic policy aspects of the production, marketing, and income problems of farmers.
Prerequisite: AgEc 367, Econ 300 or 301.

AgEc 493. (3-0; 0-0)or(0-0; 3-0)
Agricultural Growth and Adjustment—Achieving optimum use of resources in agriculture under conditions of economic growth and technological change.
Prerequisite: AgEc 367, Econ 300 or 301.

NOTE: The following courses are open only to graduate students, and to senior students with the consent of department.

AgEc 500.
Research Projects in Agricultural Economics—Investigation of special problems. Credit according to work done, with a maximum of three credit hours.

AgEc 516. (3-3; 0-0)or(0-0; 3-0)
Analytical Techniques—Applications of advanced mathematical and statistical techniques in the analysis of agricultural economics problems.
Prerequisite: Consent of department.

AgEc 533. (3-3; 0-0)or(0-0; 3-0)
Production Economics—Production principles applied to resource use, static and dynamic theory of the firm, uncertainty and expectations.
Prerequisite: AgEc 362, Econ 300 or 301.

AgEc 553. (3-0; 0-0)or(0-0; 3-0)
Economics of Land Use and Conservation—Economic principles applied to conservation, exploitation, and development.
Prerequisite: AgEc 362, Econ 300 or 301.

AgEc 563. (3-0; 0-0)or(0-0; 3-0)
Market Structure and Behaviour—Analysis of market organization, structural elements and their relations to market behavior.
Prerequisite: AgEc 362, Econ 300 or 301.

AgEc 583. (3-2; 0-0)or(0-0; 3-2)
Price Analysis and Forecasting—Economic and statistical analysis of agricultural commodity and price behavior; price forecasting techniques.
Prerequisite: AgEc 315 and 385, Econ 300 or 301.

AgEc 601. (1S-0; 1S-0)
Agricultural Economics Seminar

AgEc 613. (3-0; 0-0)or(0-0; 3-0)
Research Methods—Prerequisite: Consent of department.

AgEc 633. (3-0; 0-0)or(0-0; 3-0)
Resource Efficiency and Allocation—Prerequisite: AgEc 533.

AgEc 663. **(3-0; 0-0)or(0-0; 3-0)**
Market Performance—Prerequisite: AgEc 563.

AgEc 673. (3-0; 0-0)or(0-0; 3-0)

Topics in Agricultural Economics—Prerequisite: AgEc 473 or consent of Department.

Rural Sociology

RSoc 300 (3-0; 0-0)

Introduction to Rural Sociology—Introduction to the principles of rural sociology.

Note: Not open to students who have credit in Sociology 202.

RSoc 350. (3-0; 3-0)

Sociology of Community Development—A study of human communities; their institutional structure, ecological factors associated with patterns of growth, community relations, community planning, and community development.

Prerequisite: RSoc 300 or Soc 202.

Note: This course is the same as Sociology 350.

RSoc 356. (3-0; 0-0)or(0-0; 3-0)

Sociology of Rural Life—A study of the rural community and rural social systems, with special reference to changes in the rural way of life.

Prerequisite: RSoc 300 or Soc 202.

Note: This course is the same as Sociology 356.

RSoc 456. (3-0; 0-0)or(0-0; 3-0)

Rural Social Problems and Public Policy—Social Problems in Canadian rural life; analysis of policy making processes related to these problems.

Prerequisite: Ag 367, RSoc 356, or consent of department.

Note: This course is the same as Sociology 456.

RSoc 458. (3-0; 0-0)or(0-0; 3-0)

Agrarian Social Movements—A sociological analysis of the major agrarian social movements in North America.

Prerequisite: RSoc 356; Soc 345 recommended; or consent of department.

Note: This course is the same as Sociology 458.

AGRICULTURAL ENGINEERING

STAFF:—

Professor and Head—F. V. MacHardy

Associate Professors—T. A. Preston, B. T. Stephanson

Assistant Professor—J. B. McQuitty

AgEn 200.—F. V. MacHardy (3-0; 0-0)

An Introduction to Agricultural Mechanization—Sources of energy and methods of energy conversion. A study of the requirements of agricultural machines and structures in relation to agricultural production and labour resources.

AgEn 301.—J. B. McQuitty (3-3; 0-0)

Heating, Ventilating and Air Conditioning Agricultural Buildings—Environmental requirements as determined by physiological principles. Environmental control.

AgEn 302.—J. B. McQuitty (0-0; 3-3)

Farm Structures—Structural design of agricultural buildings.

AgEn 303.—B. T. Stephanson (3-3; 0-0)

Agricultural Power Units—Engineering principles as related to the selection of power units.

Textbook: Barger, Carleton, McKibben & Bainer, *Tractors and Their Power Units.*

AgEn 304.—B. T. Stephanson (0-0; 3-3)

Agricultural Machines—Characteristics of the functional elements of farm machines. Methods of evaluating machine performance.

Textbook: Bainer, Kepner and Barger, *Principles of Farm Machinery.*

AgEn 305.—B. T. Stephanson (3-3; 0-0)

Agricultural Materials Handling and Processing—Characteristics of fluid, free-flow and non free-flow materials, as related to storage, flow, elevation and transport. Principles of drying and refrigeration.

AgEn 340.—T. A. Preston (0-0; 3-3)

Work Study—Application of time and motion techniques to the operation of agricultural equipment. Layout analysis. Critical path scheduling.

Tetxbook: Barnes, *Motion and Time Study.*

AgEn 342.—T. A. Preston (0-0; 3-0) or (3-0; 0-0)

Work Study—Time and motion techniques with critical path scheduling. (Not offered to students from the Faculty of Agriculture).

Textbook: Barnes, *Motion and Time Study.*

AgEn 401.—F. V. MacHardy (3-3; 3-3)

Quantitative Methods in Agricultural Mechanization—Application of quantitative methods to the solution of actual problems involving materials handling, equipment selection and production layout. The use of analog and digital computers in agricultural problem solving, control, and simulation.

Textbook: Sasieni, *Operations Research—Methods and Problems.*

AgEn 407.—T. A. Preston (3-3; 0-0)

Advanced Agricultural Work Study—Agricultural applications of critical path scheduling to work study standard data; production control and maintenance techniques in relation to large agricultural processing units.

Textbooks: Gerald Nadler, *Work Design;* A. Batterby, *Network Analysis.*

AgEn 600. (1S-0; 1S-0)

Agricultural Engineering Seminar

AgEn 601.—F. V. MacHardy (3-3; 3-3)

Operations Research—Application of statistical and mathematical techniques to selected problems in Agricultural Mechanization.

ANIMAL SCIENCE

Courses offered by the Department of Animal Science staff are arranged under the designations: Animal Science, Poultry Science and Veterinary Science.

STAFF:—

Professor and Head—L. W. McElroy

Professor, Animal Nutrition—J. P. Bowland

Professors, Poultry Nutrition—D. R. Clandinin, A. R. Robblee
Professor, Animal Genetics—R. T. Berg
Assistant Professor, Animal Biochemistry—L. P. Milligan
Assistant Professor, Animal Genetics—W. Combs
Assistant Professor, Animal Nutrition—C. M. Grieve
Assistant Professor, Animal Physiology—A. J. F. Webster
Assistant Professor, Poultry Genetics—R. T. Hardin
Lecturer, Veterinary Science—G. R. Whenham

AnSc 300.—A. J. F. Webster (3-3; 0-0)
Introductory Animal Physiology—Physiology of the organs and organ systems with emphasis on domestic animals; supporting laboratory exercises in basic and applied physiological techniques.
Prerequisites or corequisites: Chem 350, Biol 230 or permission of department.
Textbook: Guyton, *Function of the Human Body,* 2nd Edition

AnSc 310.—A. J. F. Webster, G. R. Whenham and D. R. Clandinin (0-0; 3-3)
Anatomy and Applied Physiology—Gross anatomy of farm animals and poultry, physiology of the rumen, reproduction and lactation with supporting laboratory exercises.
Prerequisites: AnSc 300 or permission of department.

AnSc 370.—L. W. McElroy, W. Combs and C. M. Grieve (3-3; 0-0)
Livestock Production and Management—Production and management problems associated with major types of livestock enterprises. Livestock and livestock products markets and government policies in relation to production and management practices.

AnSc 468.—J. P. Bowland and A. R. Robblee (3-3; 0-0)
Fundamentals of Nutrition—A study of the various nutrients including their character, functions and sources; digestion and metabolism.
Laboratory—analysis of feeding stuffs and the development of representative nutritional deficiencies in animals or poultry.
Prerequisite: Chem 350.

AnSc 469.—L. W. McElroy, J. P. Bowland and C. M. Grieve (0-0; 3-3)
Animal Nutrition—The application of nutritional principles and practices to the feeding of different classes of farm animals; principles in planning and conducting nutritional exeriments.
Prerequisite: AnSc 468 or permission of department.
Textbook: Morrison, *Feeds and Feeding,* 23rd Edition.

AnSc 470. (2 to4P; 2 to 4P)
Project Course—Library and laboratory study with a written report on a selected problem in livestock or poultry production, nutrition, breeding or physiology. Open only to fourth-year students.

AnSc 484.—R. T. Berg (3-0; 0-0)
Animal Populaion Genetics—Gene behaviour in populations; influence of mutation, migration, genetic drift and selection. Genetics of natural selection and evolution.
Prerequisite: Genetics 360 or equivalent.

AnSc 485.—W. Combs (0-0; 3-3)
Animal Improvement—Application of genetics to animal breeding and improvement.
Laboratory—problems of animal evaluation and improvement.
Prerequisite: AnSc 484.

AnSc 501. (2 to 6P; 2 to 6P)
Research Projects—One or more topics are selected for intensive laboratory or library study or both. A comprehensive written report is required.

AnSc 512. (3-3; 3-0)
Advanced Nutrition—A lecture and reading course; classical studies, experimental techniques and recent advances in nutrition.
Laboratory—experience in nutritional experimentation.

AnSc 580.—R. T. Berg (0-3L; 0-0)
Biometrical Techniques in Animal Improvement—Application of biometrical techniques to problems in animal breeding.
Prerequisite: AnSc 485 or Poult 453.
Corequisite: Biometrics 455.

AnSc 600. (1S-0; 1S-0)
Seminar—Reports by students on studies of the literature on selected topics with group discussion. Required each year of all graduate students.

AnSc 680.—R. T. Hardin (0-0; 2-4)
Procedures in Quantitative Animal Genetics—Research techniques for estimating and utilizing genetic parameters of populations.
Prerequisite: AnSc 580.
Corequisite: Computing Science 456.

Poultry Science

Poult 352.—D. R. Clandinin (0-0; 3-3)
Poultry Production—Principles and practices applicable to efficient production of various classes of poultry.

Poult 453.—R. T. Hardin (0-0; 3-3)
Poultry Improvement—Application of principles of genetics to the breeding and improvement of poultry.
Prerequisite: AnSc 484 or consent of instructor.

Poult 455.—A. R. Robblee (0-0; 3-3)
Poultry Nutrition—Nutritional requirements; effects of deficiencies; application of nutritional principles.
Prerequisite: AnSc 468 or permission of Department.

Poult 459.—A. R. Robblee (3-0; 0-0)
Processing Poultry and Poultry Products—Factors influencing product quality; preservation of eggs and poultry meats.

Poult 460.—D. R. Clandinin (3-3; 0-0)
Poultry Diseases and Hygiene—A study of the more important diseases of poultry—causes, symptoms, prevention and control.

Veterinary Science

VetSc 300.—G. R. Whenham (3-0; 0-0)

Introduces veterinary medicine, its role in livestock production, infectious diseases, immunology, etiology, disease control programs and legislation; emphasis is placed on animal diseases of regional significance.

BIOCHEMISTRY

Bioch 300.—Members of Staff (3-3; 3-3)

General Course—Structure and chemistry of the cell; acidimetry and alkalimetry; chemistry of carbohydrates, lipids, proteins and nucleic acids; enzymes; bioenergetics; digestion, absorption and intermediary metabolism of carbohydrates, lipids, proteins, and nucleic acids; mineral metabolism; vitamins; blood chemistry; chemistry of respiration.

Prerequisites: Chemistry 230, Chemistry 250.

Plant Biochemistry
(See Plant Physiology and Biochemistry)

BIOLOGY

Biol 130. (3-3; 3-3)

An introduction to Biology, with emphasis on principles. not open to students with credit in Biology 30.

Biol 230. (3-3; 3-3)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This course is prerequisite to most senior biology courses.

Prerequisite: Biology 30 or Biology 130.

Biol 231. (3-3; 0-0)or(0-0; 3-3)

Plant Form and Function—Comparative morphology and physiology of plants at an intermediate level.

(Open only to students beyond their first year, who have an elementary University zoology course, and require some equivalent botany.)

Biol 232. (3-3; 0-0)or(0-0; 3-3)

Comparative Zoology—Animal morphology, physiology and development at an intermediate level.

(Open only to students beyond their first year, who have an elementary University botany course, and require some equivalent zoology.)

BIOMETRICS

Biom 455.—Saul Zalik (Plant Science) (3-3; 3-3)

Statistics for Biological Research—Principles and methods of statistical analyses applied to biological data; with emphasis on sampling, chi-square and t-tests, regression and correlation, analysis of variance (major emphasis), covariance, partial and multiple correlation and regression, individual degrees of freedom, transformation of data, simple experimental designs.

Textbook: Steel and Torrie, *Principles and Procedures of Statistics.*

Biom 605.—L. P. V. Johnson (Genetics) (0-0; 2-3)

Design of Experiments—Complex experiments, single degrees of freedom, factorial experiments, split-plot experiments, lattice designs, balanced incomplete-block design, long-term experiments.

Prerequisite: Biometrics 455, Math 450 or permission.

BOTANY

Biol 231.—(See Biology)

Plant Form and Function.

Bot 300. (3-3; 3-3)

Flowering Plants—The origin and evolution of flowering plants; their morphology and classification; species concepts; plants in relation to their environment; principles of nomenclature.

Prerequisite: Biology 230 or consent of department.

Bot 310. (3-3; 3-3)

Plant Anatomy and Histology—A course in the structure and development of organs and tissues of the higher plants. Emphasis is placed on the experimental approach to anatomical studies and on development and morphology.

Prerequisite: Biology 230 or consent of department.

Bot 320. (3-3; 3-3)

Introductory Plant Physiology—A general introductory course in plant physiology including coverage of recent advances in water relations, permeability, active uptake of salts, enzymes, respiration, photosynthesis, intermediary metabolism, nitrogen assimilation and translocation.

Prerequisites or Corequisites: Biology 230, Chemistry 230, Chemistry 250 or 350, or consent of department.

Bot 341. (3-3; 0-0)

Mycology—A systematic survey of the fungi with detailed study of representatives of major groups. Emphasis is given to classification, life cycles and distribution.

Prerequisite: Biology 230 or consent of department.

Bot 342. (0-0; 3-3)or(3-3; 0-0)

Factors affecting growth and reproduction of fungi; beneficial and harmful activities of fungi.

Prerequisite: Biology 230 *and* Botany 341 or consent of department.

CHEMISTRY

Chem 230. (3-1S-3)(3-1S-3)

Inorganic Chemistry—Lectures: The fundamental concepts of chemistry as applied to the elements and their compounds.

Laboratory: The preparation of compounds, quantitative chemistry.

Prerequisite: Chemistry 130 or 30 of High School or equivalent.

Chem 250. (3-1s*-3; 3-1s*-3)

Organic Chemistry—Lectures: An introduction to a study of the compounds of carbon.

Laboratory: The preparation of some organic compounds.

Textbook: Boyd and Morrison, *Organic Chemistry.*

Prerequisite: Chemistry 130 or Chemistry 30 or equivalent.

Chem 350. (3-3; 3-3)

Organic Chemistry—Lectures: An introduction to a study of the compounds of carbon.

Laboratory: The preparation of some organic compounds.

Prerequisite: Chem 230.

Chem 370. (3-3; 3-3)

Elementary Physical Chemistry—Lectures: The laws of thermodynamics; properties of gases, liquids and solids; solutions, equilibrium; phase rule; electrochemistry, colloids, kinetics of reaction.

Laboratory: Physical chemical measurements.

Prerequisites: Chem 230 or 232

Prerequisite or Corequisite: Math 180 or 201 or 206 or 207 or consent of department.

CIVIL ENGINEERING

CivE 338.—A. W. Peterson (2-0; 2-0)

Principles of Irrigation and Drainage—Elementary problems of hydraulics and drainage as applied to the lay-out of irrigation systems. Waterlogging and alkali formation.

COMPUTING SCIENCE

Cmput 456. (0-0; 3-0)

Digital Computer Programming with Statistical Applications—Digital computers and programming languages; principles of program preparation; Fortran IV; applications to statistics and the biological sciences.

Prerequisites: Statistics 241, 255, 305 or 450, Biometrics 455, or consent of the Department.

DAIRY AND FOOD SCIENCE

Courses in the department are given in the following divisions: General Dairy and Food Science, Dairy and Food Processing, Dairy and Food Microbiology, Dairy and Food Chemistry. (See Third and Fourth Years, under PROGRAMS OF STUDY).

STAFF:—

Professor and Head—L. F. L. Clegg

Associate Professors—J. M. deMan, F. W. Wood

Assistant Professor—H. Jackson

Research Associate—J. G. Armstrong

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*Students not concurrently taking Chem 230 are required to take the one hour seminar.

General Dairy and Food Science

Da&Fd 241.—L. F. L. Clegg (0-0; 3-3)

Principles of Milk Production—Milk secretion. Mechanics and operation of machine milking. Mastitis and milking procedure. Systems of milking. Cleaning and sterilization of dairy equipment. Quality milk. Composition and constituents of milk.

Da&Fd 490.—All Staff

Reading Project: Critical Reviews of Selected Literature—Maximum yearly credit one full course. (For third and fourth year students only).

Da&Fd 650.—All Staff (1S-0; 1S-0)

Seminar—Reports and discussion of research problems. Required during each year of all graduate students in the department.

Dairy and Food Processing

Da&Fd 352.—F. W. Wood (3-3; 0-0)

Elements of Food Processing—The scientific and technical principles involved in unit operations and processes applied in the commercial manufacture of dairy and other food products. To include heat exchange, pumping, disintegrating, emulsifying, evaporating and condensing, storing and packaging.

Textbook: Charm, S. E., *Fundamentals of Food Engineering.*

Da&Fd 353.—F. W. Wood (0-0; 3-3)

Processing Dairy Products—The application of unit operations and processes in the commercial manufacture of dairy products.

Prerequisite: Dairy & Food 352 or permission of department.

Da&Fd 451.—F. W. Wood (3-3; 0-0)

Industrial Food Processing—A study of the commercial processing of food products with particular emphasis on the unit operations involved in canning fruits and vegetables. The function of management and quality control; grading and packaging standards.

Textbook: Cruess, *Commercial Fruit and Vegetable Products.*

Da&Fd 452.—F. W. Wood (0-0; 3-3)

Industrial Food Processing—A study of freezing, dehydration, freeze drying, concentration and fermentation of commercial foods. New product development and marketing of processed foods. Instruction will include pilot plant processing and field trips to processing plants.

Prerequisite: Dairy & Food 451 or permission of the department.

Dairy and Food Microbiology

Da&Fd 465.—L. F. L. Clegg (3-3; 0-0)

Food Microbiology—The microbiology of the food and allied industries including sterilization and preservation (canning, freezing, radiation), food poisoning, food spoilage, the contamination of air and water, the disposal of domestic and industrial wastes.

Prerequisite: Microbiology 360 or permission of department.

Da&Fd 466.—H. Jackson (0-0; 3-3)

Dairy Microbiology—The microbiology of the production and distribution of fluid milk and cream and consideration of some of the problems of the market milk industry. Milk supplies and public health. The microbiological and biochemical aspects of pasteurization. The microbiology of butter, cheese, ice cream and other milk products.

Prerequisite: Microbiology 360 or permission of department.

Da&Fd 560.—H. Jackson (1L-4; 0-0)

Industrial Microbiology—A laboratory lecture course concerning some advanced techniques in industrial microbiology, including studies of small scale fermentations.

Prerequisite: Da&Fd 465 or 466 or permission of department.

Da&Fd 561.—L. F. L. Clegg and H. Jackson (0-0; 1L-4)

Advanced Food Microbiology—A laboratory lecture course covering some advanced techniques and recent developments in food microbiology.

Prerequisite: Da&Fd 465 or 466 or permission of department.

Da&Fd 562.—H. Jackson (3-0; 0-0)

Industrial Microbiology—A study of the industrial significance of micro-organisms; the principles of fermentation, aeration, agitation, sterilization and equipment design; the isolation, screening and maintenance of micro-organisms; the production of alcoholic beverages; microbial preservation of foods.

Prerequisites: Plant Physiology and Biochemistry 431 and 432 (or Biochemistry 300) and Microbiology 360 or Da&Fd 465 or 466 or permission of department.

Da&Fd 563—H. Jackson (0-0; 3-0)

Industrial Microbiology—The utilization of micro-organisms in the production of organic acids, antibiotics, solvents, vitamins, and enzymes; microbial transformation; biological utilization of waste materials; micro-organisms as a source of food materials; continuous culture in the microbiological industries; recent developments.

Prerequisites: Plant Physiology and Biochemistry 431 and 432 (or Biochemistry 300) and Microbiology 360 or Da&Fd 465 or 466 or permission of department.

Da&Fd 660.—H. Jackson and L. F. L. Clegg (0-0; 3-0)or(3-0; 0-0)

Advanced Applied Microbiology—A lecture and discussion course on topics of current interest in industrial and food microbiology with reading of original literature.

Dairy and Food Chemistry

Da&Fd 474.—J. M. deMan (3-3; 0-0)

Food Analysis and Quality Control—The scientific principles underlying the chemical, physical and sensory methods of food analysis. Qualitative and quantitative estimation of food constituents and chemical additives. Application of instrumental methods to the analysis of foodstuffs.

Prerequisites: Chemistry 230 and Plant Biochemistry and Physiology 431 and 432, or Biochemistry 300 or permission of department.

Da&Fd 475.—J. M. deMan (0-0; 3-3)

Food Chemistry—Chemical and physical properties and composition of food fats, proteins and carbohydrates. Food flavours, additives in foods. Effect of processing on some chemical and physical properties of foods.

Textbook: Meyer, *Food Chemistry.*

Prerequisite: Plant Biochemistry and Physiology 431 and 432, or Biochemistry 300 or permission of department.

Da&Fd 476.—J. M. deMan (3-3; 0-0)

Dairy Chemistry—Biochemistry of milk formation and secretion. Composition of milk. Chemistry of the major and minor constituents of milk. Enzymic and non-enzymic deterioration reactions. Flavors and off-flavors. Physical properties of milk and milk products. Changes in chemical and physical properties caused by processing.

Textbook: Jenness and Patton, *Principles of Dairy Chemistry.*

Prerequisite: Plant Biochemistry and Physiology 431 and 432, or Biochemistry 300, or permission of department.

Da&Fd 671.—J. M. deMan (0-0; 3-3)

Advanced Food Chemistry—The relation of food constituents to industrial processes. Enzymic and non-enzymic deterioration reactions in foods. Surface chemistry. Flavor and sensory testing. Rheology of foodstuffs.

Prerequisite: Plant Biochemistry and Physiology 431 and 432, or Biochemistry 300 or permission of department.

Da&Fd 672.—J. M. deMan (0-0-; 1-3)

Chemistry of Fats and Oils—Composition, structure and properties of the various lipid classes. Synthesis and structure of the various fatty acids and glycerides. Technical processes used in the production and refining of edible fats. Autoxidation and antioxidants. Glyceride structure of natural fats. Crystallization behaviour and polymorphism. Modern analytical methods used in the field of fats and oils.

Prerequisites: Plant Biochemistry and Physiology 431 and 432, or Biochemistry 300, and Da&Fd 475.

ECONOMICS

Econ 200.—Members of the Department (3-0; 3-0)

Principles of Economics—A survey of various aspects of economics: The nature of economic problems and systems; the functions of money; commercial and central banking; national income analysis; monetary and fiscal policy; pricing under competitive and monopolistic conditions; selected topics in analysis and policy.

(Prerequisite for all senior Economics courses except 310, 311 ,and 330.)

Econ 300. (3-0; 3-0)

Micro-Economic Analysis—The theory of consumer behavior; price and output determination under competition, monopoly and other market structures; the allocation of resources and resource pricing; the distribution of income.

Prerequisite: Economics 200 or 302.

Econ 367.—E. Berg (3-0; 0-0)

Economics of Agriculture—An introduction to the nature and scope of agricultural economics; economic aspects of agricultural production, marketing, finance, resource use, prices, and policy; relation of the agricultural sector to the economy as a whole; analysis of structural change, economic growth and adjustment in agriculture.

Prerequisite: Economics 200 or 302.

Note: This course is also listed as Agriculutral Economics 367 and is not open to students who have credit for that course or Agricultural Economics 303.

Econ 368.—E. Berg (0-0; 3-0)

Economics of World Agriculture—A survey of the world structure of agricultural production, consumption, and trade; international agricultural policies and agreements; impact of regional economic integration on agriculture; interrelation of economic development and trade in agricultural commodities.

Prerequisite: Economics 200 or 302.

Note: This course is also listed as Agricultural Economics 368 and is not open to students who have credit for that course.

Econ 560. (3-0; 3-0)

Agriculture in Developing Countries—An analysis of the role and problems of agriculture in developing countries.

ENGLISH

Engl 210. (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

ENTOMOLOGY

STAFF:—

Professor and Head—Brian Hocking

Professor—G. E. Ball

Associate Professor—W. G. Evans

Assistant Professors—Janet Sharplin, R. H. Gooding

Ent 200.—B. Hocking and W. G. Evans (3-3; 0-0)

An Introduction to General and Agricultural Entomology—The structure and life cycles of insects and related anthropods. An introduction to classification. The relationships of insects with their environment and with other forms of life as a basis to an appreciation of their significance in agriculture.

Textbook: Imms, *Outlines of Entomology.*

Prerequisite: Biology 30 or 130 or equivalent.

Ent 201.—B. Hocking and G. E. Ball (3-3; 3-3)

General Entomology—Probable origin of insects and related anthropods, their structure and development. Introduction to classification. Their relationships with other forms of life as a basis to an appreciation of their significance in connection with agriculture and human health.

Textbook: Imms, *Outlines of Entomology.*

Prerequisite: Biology 30 or 130 or equivalent.

Ent 302.—B. Hocking and R. H. Gooding (0-0; 3-3)

A Survey of Entomology—The lives of insects and some related arthropods from a functional view point, leading into a consideration of their relationships with the physical environment and with other organisms including man.

Prerequisite: Biology 30 or 130 or equivalent.

Pre-or Corequisite: Zoology 350.

Ent 314.—Janet Sharplin (2-6; 2-6)

Insect Morphology—A detailed study of the structure of insects from the comparative and functional viewpoints.

Textbook: Snodgrass, *Principles of Insect Morphology.*

Prerequisite: Entomology 200 (300), 201 (301) or 302.

Ent 471.—Staff

A Project in Applied Entomology—A survey of the literature on one or more topics in applied entomology with or without an experimental study of a related simple problem.

Credit according to work done, up to a maximum of one full course.

Ent 476.—R. H. Gooding (2-4; 2-4)

Insect Toxicology—The chemistry of insecticides and repellents and of accessory materials. Methods of insecticide evaluation. Theories of insecticidal activity.

Textbook: Shepard, *The Chemistry and Action of Insecticides.*

Prerequisite: Chemistry 250 or 350, Entomology 200, 201 or 302 desirable.

Ent 522.—G. E. Ball (2-6; 2-6)

Insect Taxonomy—Taxonomic principles and procedures. Classification of insects; habits of all important groups. Zoological nomenclature. Speciation, phylogeny, zoogeography.

Textbook: Mayr, Linsley, and Usinger, *Methods and Principles of Systematic Zoology.*

Prerequisite: Entomology 200, 201 or 302, 314 desirable.

Ent 556.—B. Hocking (2-5; 2-5)

Insect Physiology—Life processes illustrated by insects with emphasis on those peculiar to them and to their relatives.

Textbook: Wigglesworth, *The Principles of Insect Physiology.*

Prerequisite: Entomology 200, 201 or 302, 314 desirable.

Permission of the instructor is required for registration.

Ent 560.—W. G. Evans (2-5; 2-5)

Insect Ecology—The relationships of insects to their environment with emphasis on the factors which influence the distribution of insects in time and space. Associations between insects and other organisms. Populations.

Prerequisite: Entomology 201, or Entomology 200 or 302 and 471.

Ent 610.—J. Sharplin

Advanced Morphology and Histology—A continuing course from Entomology 314 including a detailed study of internal structure. Credit according to work done, up to a maximum of one full course.

Ent 621.—G. E. Ball (0-6; 0-6)

Advanced Taxonomy—Classification and biology of, and literature on, one or more of the major orders.

Prerequisite: Entomology 522.

Ent 650.—B. Hocking

A Project in Insect Physiology—A review and interpretation of literature on a selected topic with an experimental study of a related problem. Credit according to work done, up to a maximum of one full course.

GENETICS

Courses offered by the Department of Genetics are arranged under the designations: Genetics, Field Crops, and Biometrics.

STAFF:—

Professor and Head—

Professors—L. P. V. Johnson, K. A. Lesins

Associate Professor—W. E. Smith

Genet 351. (3-3; 3-3)

Genetics—Fundamental principles and processes relating to heredity.

Prerequisite: Biology 30 or 130.

Genet 360. (0-0; 3-3)

Genetics—The physical bases of heredity, Mendelian inheritance, inheritance of sex, linkage, quantitative inheritance, gene structure and function, gene mutation and chromosomal aberrations, cytoplasmic inheritance, developmental genetics, populations and races, human genetics and eugenics.

Genet 430. (3-0; 0-0)

Microbial Genetics—Detailed analysis of genetic phenomena peculiar to micro-organisms.

Prerequisite: Genetics 351 or equivalent.

Genet 463. (0-0; 3-0)

Genetic Basis of Plant Breeding—Prerequisite: Genetics 351 or 360.

Genet 481. (3-0; 0-0)

Population Genetics—Gene behavior in populations.

Prerequisite: Genetics 351 or equivalent.

Genet 483. (0-0; 3-0)

Evolutionary Genetics—Population genetics as related to problems in evolution.

Prerequisite: Genetics 481.

Genet 505.

Reading and Research Projects in Genetics and Plant Breeding—A course in which individual students select a topic for intensive study and prepare a written report. Regular meetings for discussion. Credit according to work done, with a maximum of six hours.

Genet 511. (3-3; 0-0)
Cytology—Structural and biochemical organization of cellular organelles; application of analytical techniques.
Prerequisite: Chemistry 250, or 350, and Genetics 351 or equivalent.

Genet 515. (0-0; 3-3)
Cytogenetics—Advanced topics in cytogenetics.
Prerequisite: Genetics 351 or equivalent.
(Not offered in 1966-67)

Genet 517 (3-3; 0-0)
Genetical Statistics—Principles and methods of biometrical analysis applied to specific problems such as quantitative inheritance and linkage.
Prerequisite: Genetics 351 or equivalent.

Genet 520. (0-0; 3-0)
Quantitative Genetics—Gene behavior and genetic analysis in natural and experimental populations.
Prerequisite: Genetics 351 or equivalent.
(Not offered in 1966-67)

Genet 545. (0-0; 3-0)
Biochemical Genetics—Gene action at the molecular and biochemical levels; coding.
Prerequisite: Genetics 351 or equivalent.

Genet 552. (0-0; 3-3)
Radiation Genetics—The biological effects of ionizing and non-ionizing radiation at the cellular level.
Prerequisite: Genetics 351 or equivalent.
(Not offered in 1966-67)

Genet 586. (0-0; 3-0)
Developmental Genetics—Detailed study of gene-controlled processes of development and differentiation.
Prerequisite: Genetics 351 or equivalent.
(Not offered in 1966-67)

Genet 590. (3-0; 0-0)
Classical Contributions to Genetics—An historical approach giving perspective to pre- and post-Mendel advances in genetics.
Prerequisite: Genetics 351 or equivalent.

Genet 601.
Advanced Genetics—A seminar course on advanced and current topics of genetics.

Genet 635. (0-4; 0-4)
Advanced Microbial Genetics—An advanced laboratory course dealing with genetics of fungi, bacteria, and bacteriophages.
Prerequisite: Genetics 430.
(Not offered in 1966-67)

Genet 650. (3-0; 0-0)

Genetics of Parasitic Systems—The genetics of host-parasite interrelationships.

(Not offered in 1966-67)

Biometrics

Biom 605.

Design of Experiments—See BIOMETRICS.

Field Crops

FCr 354. (0-0; 3-3)

Forage Crops—Cultivated forage legumes and grasses: their morphological, physiological and nutritional characteristics; their suitability for hays and pastures, and their conservation as hay and silage. Principles of silage making; use of additives. Rational utilization of pastures. Laboratory identification of forages at their vegetative and flowering stages, and by seeds. Botanical analysis of hay. Evaluation of seed material.

FCr 355. (3-3; 0-0)

Cereal and Specialty Crops—Economically important cereal and specialty crops produced in North America, their history, classification, structure, adaptation, distribution and use. The laboratory consists of a study of gross morphology and taxonomy of widely-grown field crops.

FCr 503.

Reading Projects—A course in which individual students select a topic for intensive study in the library and prepare a written report. Regular meetings for discussion. Credit according to work done, with a maximum of six hours.

FCr 504.

Research Projects—Investigation of special problems involving field or laboratory study. Credit according to work done, with a maximum of six hours.

GEOLOGY

Geol 201.—R. E. Folinsbee (3-3; 3-3)

General Geology—Processes of destruction and reconstruction; interpretation of physiographical features with map study; stratigraphic column with index fossils from each period; common minerals and rocks.

Textbook: Holmes, *Principles of Physical Geology* or Gilluly et al., *Principles of Geology.*

Geol 202.—R. E. Folinsbee (3-3; 0-0)

Physical Geology—An introduction to the study of the earth, materials of the earth's crust, minerals and rocks, geological processes and time.

Textbook: Holmes, *Principles of Physical Geology.*

Geol 302.—R. A. Burwash (3-3; 3-3)

Geology and Mineral Deposits of Canada—The study of the geological regions of Canada; their stratigraphy, structure, and mineral deposits.

Prerequisite: Geology 201 or consent of department.

Note: This course is sequential to Geology 201, and is designed for students not majoring in Geology.

Geol 465.—A. J. Broscoe (3-3; 0-0)

Geomorphology—A study of land forms and the processes which create and modify them: weathering, mass-wasting, stream erosion, wave erosion, wind erosion, and glaciation; study of landforms on aerial photographs and topographic maps; field trips.

Textbook: Thornbury, *Principles of Geomorphology.*

Prerequisite: Geology 202 or consent of department.

Geol 466.—J. Westgate (0-0; 3-3)

Glacial Geology—Elements of glaciology; description of glacial deposits and land forms; glacial stratigraphy of North America and Europe; interpretation of glacial features from topographic maps and aerial photographs; examination of glacial sediments; field trips.

Textbook: Flint, *Glacial and Pleistocene Geology.*

Prerequisite: Geology 201 or 202.

LANGUAGES OTHER THAN ENGLISH

French

Fren 100. (5-0; 5-0)

Beginners' French—This course is designed to enable students entering with complete matriculation but without French to begin their study of this language in the University. Normally, students will go from French 100 to French 200.

Fren 200. (3-1; 3-1)

First Year University French—This is an intensive course in spoken and written French. The course includes grammar, composition, and literature.

Prerequisite: French 30 or French 100.

German

Germ 210. (3-0; 3-0)

Scientific German—This is an intensive course for beginners only, aimed at giving students a reading knowledge of scientific German. It is especially designed to meet the needs of honors students from Science departments and of students of the professional faculties who wish to acquire a knowledge of scientific German.

Russian

Russ 210. (3-0; 3-0)

Beginners' Russian (Science Section)—This course is designed to meet the needs of honors students in the science departments, students of the Faculties of Engineering, Agriculture, Dentistry, Medicine and Graduate Studies of any year who require a reading knowledge of Russian scientific literature.

MATHEMATICS

Math 180. (4-0; 4-0)

Trigonometry and Polynomial Calculus—Trigonometric functions and identities. Solution of triangles. Simple algebraic curves. Differentiation and integration of elementary functions. Applications.

Prerequisite: Mathematics 30 or its equivalent.

Math 201. (5-0; 5-0)

Introductory Calculus—Rates of change. Differentiation and integration of simple functions. Applications. Analytical geometry of the conic sections. Exponential, logarithmic and trigonometric functions.

Prerequisite: Mathematics 30 and 31 or their equivalents.

Corequisite: Some students lacking Mathematics 31 or its equivalent may take Mathematics 201 by taking Mathematics 101 concurrently. (See the conditions under which a student may take Mathematics 101).

Math 220. (3-0; 3-0)

Elementary Calculus—Differentiation and integration of trigonometric functions. Polar coordinates. Logarithmic and exponential functions. Conic sections. Areas and volumes.

Prerequisite: Mathematics 180.

Math 240. (3-1: 0-0)or(0-0; 3-1)

Elementary Calculus—Limits and derivatives. Differentiation of simple functions. Graphs, extrema and inequalities. Integration of simple functions. Infinite sequences and series.

Prerequisite: Mathematics 30 or equivalent.

Note: This course is designed as a prerequisite for Statistics 241.

Math 242. (3-1; 3-1)

Elementary Calculus and Probability—Limits and derivatives. Differentiation of simple functions. Graphs, extrema and inequalities. Integration of simple functions. Infinite sequences and series.

Elementary set theory. Finite sample spaces. Probability as a set function. Conditional probability and Bayes' formula. Hypergeometric and binomial distributions. Moments, standardization and the law of large numbers. Density and distribution functions of continuous random variables. Expectation. Poisson and normal approximations of the binomial distribution.

Prerequisite: Mathematics 30 or equivalent.

Math 243 (3-2; 0-0)

Linear Algebra—Vector and matrix operations. Linear systems of equation, dimension, axiomatic definition of vector space, constructive solution of linear equations, computation of inverses. Linear inequalities, convex sets, introduction to linear programming. Binary relations: equivalence, order, graphs. Invariants, canonical forms, eigenvalues and quadratic forms. Finite Markov chains.

Prerequisite: Mathematics 30.

Math 340. (0-0; 3-2)

Analysis, Difference and Differential Equations—Functions of several variables. Partial derivatives, extreme values, Lagrange multipliers, complex numbers, complex numbers and exponentials. Euler's formula: Linear difference and differential equations with constant coefficients. Interpolation procedures. Systems of linear equations. Numerical solutions and iterative methods.

Prerequisite: Mathematics 240 or 242 or equivalent.

Math 304. (3-2; 3-2)

Calculus and Analytical Geometry—Determinants. Polar and parametric coordinates. Methods and applications of integration. Infinite series. Vectors and space geometry. Partial differentiation. Complex numbers. Elements of linear differential equations. Multiple integrals.

Prerequisite: Mathematics 201 or 220.

MICROBIOLOGY

Micrb 201. (3-3; 0-0)

Elementary Microbiology—General microbiology; the importance of micro-organisms in every day life.

Demonstrations and practical laboratory exercises.

Micrb 360. (3-3; 3-3)

General Microbiology—A course in general microbiology including classification, physiology and metabolism, serving as an introduction to the practical application of this knowledge in industrial processes, specific fields of animal and plant biology and public health. The laboratory course illustrates the basic methods of studying micro-organisms and their products and introduces the principles of the application of this knowledge.

Prerequisite: A university course in Chemistry and Botany 202.

Textbook: Stanier, Doudoroff, Adelberg, *The Microbial World,* or Pelczar and Reid, *Microbiology.*

PHYSICAL EDUCATION

PEd 218—Physical Education Staff (Men) (0-2; 0-2)

Recreational Activities—Emphasis on the fundamentals of the following recreational and fitness activities: circuit training, aquatics, handball, badminton, volleyball, tumbling and apparatus.

PEd 228.—Physical Education Staff (Women) (0-2; 0-2)

Recreational Activities—Emphasis on the fundamentals of the following recreational and fitness activities: aquatics, movement fundamentals, tennis, badminton, dance and golf.

PHYSICS

Phys 100. (3-3; 3-3)

Introductory General Physics—Introduction to the experimental phenomena and theoretical ideas of physics. This course may be taken as a substitute for Grade XII physics, but is given from a more advanced point of view with greater reference to current developments. This course may not be taken for credit by students who already have credit for Physics 30.

Phys 200. (3-3; 3-3)

General Physics—A general course in the fundamentals of physics, including mechanics, properties of matter, heat, sound, electricity and light, illustrated by experiments. For students who have completed Physics 30.

(NOTE: Students will not be able to take a further course in Physics without taking Mathematics 201. Physics 200 may not be taken as a second course following Physics 100.)

Physics 100 is a terminal course. It is the only choice available to students lacking credit in Grade XII physics, and does not fulfil prerequisite requirements to any senior physics courses. Physics 200 may be taken following Grade XII phyics; it is accepted as a prerequisite for certain courses on advanced topics in physics.

PLANT SCIENCE

Courses offered by the Department of Plant Science are arranged under the designations: Plant Science, Biometrics, Horticulture, Plant Pathology, Plant Physiology and Biochemistry, Weed Science and Crop Ecology.

Note: Field Crops and Forage Crops are listed under Genetics.

STAFF:—

Professor and Head—Wm. G. Corns

Professors—A. G. McCalla, Plant Biochemistry; Saul Zalik, Plant Physiology and Biochemistry; Mary S. Spencer, Plant Physiology and Biochemistry.

Associate Professors—W. T. Andrew, Horticulture; R. H. Knowles, Horticulture; W. P. Skoropad, Plant Pathology; Wm. H. Vanden Born, Weed Science and Crop Ecology.

Assistant Professors—E. W. Toop, Horticulture; N. Colotelo, Plant Pathology; A. Bailey, Weed Science and Crop Ecology; Z. C. Hiruhi, Plant Pathology.

Plant Science

PlSc 356.—Wm. G. Corns (0-4L; 0-0)

Rangeland Vegetation—Occurrence, identification, characteristics and habits of some grasses, weeds and other vegetation of grassland and forest regions in relation to their utilization and conservation.

(Recommended as a prerequisite or corequisite for Plant Science 357)

PlSc 357.—Wm. G. Corns (3-0; 0-0)

Vegetation Control and Applied Ecology—Ecological factors affecting plant growth and regional distribution of different types of vegetation and land use. The use of herbicides and associated agronomic practices in relation to land clearing and breaking, development and management of grassland and forest vegetation, wildlife regions, parks, aquatic areas and industrial sites.

(Recommended as a corequisite for Plant Science 356.)

(Note related courses under Weed Science.)

PlSc 500 (0-1S; 0-1S)

Seminar in Plant Science—Oral reports by individual students covering the literature on selected topics. Required each year of all graduate students in Plant Science.

Biometrics

PlSc 455.

Statistics for Biological Research—See BIOMETRICS.

Field Crops

FCr 354, 355, 503 and 504

See GENETICS.

Horticulture

Hort 341.—Wm. T. Andrew and R. H. Knowles (0-0; 3-3)

General Horticulture—Elementary course designed for those students who do not wish specialized instruction in the various phases of horticulture. A

survey of world horticulture, with an introduction on propagation, culture, nutrition, and utilization of horticultural plants. Laboratory work in propagation and cultural practices.

Hort 352.—Wm. T. Andrew and E. W. Toop (3-3; 0-0)

Principles of Horticulture—A general course in horticulture, with special emphasis on the physiology of horticultural crops. Laboratory practice in systematic horticulture; culture, marketing, and preservation of crops; their economic importance and value as foods.

Prerequisite: Biology 230.

Hort 360.—Staff (0-4L; 0-0)

Systematic Horticulture—A course designed for the student with special interests in horticulture. A study of the classification, nomenclature, adaptation and morphology of horticultural plants.

Hort 454. (0-0; 3-3)

Fruit Crops—Methods of tree fruit propagation, production and marketing, discussion of cultural practices and nutrition.

Hort 455.—Wm. T. Andrew (0-0; 3-3)

Vegetable Crops—Classification, food value, seedage, plant growing techniques, nutrition, harvesting, grading, packing and packaging, storage and marketing of important vegetable crops.

Prerequisite: Horticulture 352 or consent of instructor.

Hort 457.—E. W. Toop (0-0; 3-3)

Floriculture—The principles and practices of growing florists' crops under glass. The effect of environment on growth and development of specific crops.

Hort 460.—R. H. Knowles (3-3; 0-0)

Landscape Architecture—An introductory course covering: (1) The elements and principles of design; (2) the application of these principles to the arrangement of objects in space; (3) Problems in landscape design in which technological, social and economic requirements are considered in relation to the aesthetics of planning.

Hort 461.—R. H. Knowles (0-0; 0-6)

Advanced Landscape Architecture—Problem solving, stressing the analytical approach to workable design, with reference to recreational, residential and public housing areas, schools and shopping centres.

Prerequisite: Horticulture 460.

Hort 507.—Staff

Reading Projects in Horticulture—A course in which the individual student selects a topic for intensive study in the library and prepares a written report. Regular meetings for discussion. Credit according to work done, with a maximum of six hours.

Hort 508.—Staff

Research Projects in Horticulture—Investigation of special problems involving field or laboratory study. Credit according to work done, with a maximum of six hours.

Hort 509.—Staff

Selected Topics in Horticulture—A course in which the recent developments of special interest to the horticulturist will be discussed at an advanced level, with special emphasis on modern techniques in horticultural research. Credit according to work done, with a maximum of six hours.

Plant Pathology

PlPa 480.—W. P. Skoropad (3-3; 0-0)

Principles of Plant Pathology—An introductory study of the nature, cause, and control of plant diseases.

Prerequisite: Biology 230.

PlPa 481.—N. Colotelo (3-3; 0-0)

Diseases of Field Crops—Diseases affecting grain, forage, and other field crops.

Prerequisite: Plant Pathology 480.

PlPa 482.—W. P. Skoropad (0-0; 3-3)

Diseases of Horticultural Crops—Diseases affecting potato, vegetable, fruit, and ornamental plants.

Prerequisite: Plant Pathology 480.

PlPa 511.—Staff

Reading Projects in Plant Pathology—A course in which the individual student selects a topic for intensive study in the library and prepares a written report. Regular meetings for discussion. Credit according to work done, with maximum of six hours.

PlPa 512.—Staff

Research Projects in Plant Pathology—Investigation of special problems involving field or laboratory study. Credit according to work done, with a maximum of six hours.

PlPa 631.—Staff

Advanced Plant Pathology—Principles of plant pathology, theoretical and applied.

Prerequisite: Plant Pathology 480 or the equivalent.

PlPa 635.—N.Colotelo (3-0; 0-0)

Plant Pathogenesis—A critical review of literature related to the physiology of diseased plants, e.g., effect on growth, disintegration of tissue, wilting and changes in respiration.

Prerequisites: Plant Pathology 480 or equivalent; Plant Physiology and Biochemistry 431 and 432 or Botany 320 or equivalent.

PlPa 636.—N. Colotelo (0-0; 3-0)

Plant Pathogenesis—A continuation of Plant Pathology 635; histological, physiological and biochemical defense mechanisms, toxins, fungicidal action.

Prerequisites: Plant Pathology 480 or equivalent; Plant Physiology and Biochemistry 431 and 432 or Botany 320 or equivalent.

Plant Physiology and Biochemistry

PlPh 400.—Saul Zalik (0-0; 3-0)

Physiology and Biochemistry of Crop Plants—Physiology and biochemistry of growth and development of crop plants.

Prerequisite or corequisite: Chemistry 250 or 350.

PlPh 431.—Mary S. Spencer (3-3; 0-0)

Plant Biochemistry—An introduction to plant biochemistry, with consideration of the comparative aspects of biochemistry. Topics include intracellular structure, acidity and colloidal properties of protoplasm, chemistry and metabolism of carbohydrates, including respiration and photosynthesis.

Prerequisites: Chemistry 230 and Chemistry 250 or 350, or consent of the instructor.

PlPh 432.—Mary S. Spencer (0-0; 3-3)

Plant Biochemistry—A continuation of Plant Biochemistry 431, this course deals with the biochemistry of lipids and related plant constituents, and the chemistry and metabolism of nitrogen-containing compounds.

Prerequisite: Plant Biochemistry 431.

PlPh 477. (0-0; 3-3)

Cereal Chemistry—Lectures and laboratory periods dealing with techniques in cereal chemistry and oil seed processing. Biological, chemical, and physical factors affecting quality; grain grading; methods of analyses; milling, baking; malting and other technological processes.

Prerequisite: Plant Biochemistry 431 and 432, and Field Crops 355, or equivalents.

PlPh 513.—Staff

Reading Projects in Plant Physiology and Biochemistry—A course in which the individual student selects a topic for intensive study in the library and prepares a written report. Regular meetings for discussion. Credit according to work done, with a maximum of six hours.

PlPh 514.—Staff

Research Projects in Plant Physiology and Biochemistry—Investigation of special problems involving field or laboratory study. Credit according to work done, with a maximum of six hours.

PlPh 551. (3-0; 0-0)or(0-0; 3-0)

Advanced Plant Biochemistry—Selected topics in plant metabolism, with emphasis on the comparative biochemistry of respiration and carbon assimilation. Evaluation of recent research and of methods of investigation in these fields.

Prerequisites: Biochemistry 300, or Plant Physiology and Biochemistry 431 and 432 or consent of instructor.

PlPh 620.—Saul Zalik (2-2; 2-2)

Plant Morphogenesis—An experimental approach to growth and differentiation in plants. Topics dealt with are: growth correlations; tissue culture; differentiation and regeneration; growth regulators and metabolites; external and internal factors.

Prerequisite: Consent of instructor.

Weed Science and Crop Ecology

WdSc 352.—Wm. H. Vanden Born (0-0; 3-3)

Weeds and Weed Control—The nature and significance of weed problems in various phases of crop production. Vegetative and reproductive growth and development of crop plants and weeds in relation to weed control. Taxonomy of weeds. Cultural and chemical weed control. Classification, properties and use of herbicides. Other uses of plant growth regulating chemicals.

WdSc 460.—Wm. H. Vanden Born (3-0; 0-0)

Physiology of Herbicidal Action—Absorption, translocation, mechanism of action of herbicides. Chemical and physical factors influencing herbicidal action. Selected topics.

Prerequisites: Botany 320 or Plant Physiology and Biochemistry 400; Weed Science 352.

WdSc 501.—Wm. G. Corns and Wm. H. Vanden Born

Reading Projects in Weed Science and Crop Ecology—A course in which the individual student selects a topic for intensive study in the library and prepares a written report. Regular meetings for discussion. Credit according to work done, with a maximum of six hours.

WdSc 502.—Wm. G. Corns and Wm. H. Vanden Born

Research Projects in Weed Science and Crop Ecology—Investigation of special problems involving field or laboratory study. Credit according to work done, with a maximum of six hours.

(See also Plant Science 356 and 357.)

SOIL SCIENCE

STAFF:—

Professor and Head—J. A. Toogood

Professor—C. F. Bentley

Associate Professors—F. D. Cook, S. Pawluk, J. A. Robertson, G. R. Webster

Soils 240.—J. A. Toogood and J. A. Robertson (3-3; 0-0)

Introduction to Soil Science—Origin and classification of soil materials; physical properties of mineral soils; soil water and soil air in relation to plant growth.

Textbook: Buckman and Brady, *The Nature and Properties of Soils,* 6th Edition.

Soils 250.—J. A. Robertson (0-0; 3-3)

Introduction to Soil Chemistry—Chemical compositions of soils; essential nutrients and soil fertility; soil pH and its control; nitrogen economy; C/N ratio; organic matter in soil; soluble salts in soils; cropping systems.

Textbook: Buckman and Brady, *The Nature and Properties of Soils,* 6th Edition.

Prerequisite: Soils 240 or permission.

Soils 420.—S. Pawluk (3-3; 0-0)

Soil Classification—Soil genesis, morphology and classification with emphasis on Canadian soils; soil survey reports, their interpretation and use.

Prerequisite: Soils 240 and 250, or permission.

Soils 430.—F. D. Cook (0-0; 3-3)

Soil Microbiology—Soil organisms and factors influencing their activity; the carbon, nitrogen, phosphorus and sulphur cycles; interactions between the soil microflora and herbicides, pesticides, etc; soil sterilization; the rhizosphere; the biological factor in soil genesis.

Prerequisite: Bacteriology 201 or Microbiology 360 or permission.

Soils 450.—G. R. Webster (3-3; 0-0)

Soil Colloids—Colloidal materials in the soil, both inorganic and organic; mineralogy of clays; chemical composition; cation exchange; amounts and activities of exchangeable ions; flocculation; oxides and hydroxides.

Prerequisites: Soils 240 and 250 or permission.

Soils 460.—J. A. Robertson and G. R. Webster (0-0; 3-3)

Soil Fertility—Sources of plant nutrients in the soil; nutrient availability as affected by soil conditions; soil colloids and ion exchange; fertilizer materials; methods of assessing soil fertility; soil fertility studies in Alberta and at other experimental stations.

Prerequisite: Soils 240 and 250 or permission.

Soils 470.—S. Pawluk (3-3; 0-0)

Irrigation and Drainage—Character of soil and water used for irrigation; methods of irrigation; measurement and distribution; duty; time and amount of application; removal of excess water; control of alkali; irrigation practices for various crops and soils; effects of fertility.

Textbook: Israelsen and Hansen, *Irrigation Principles and Practices.*

Prerequisite: Soils 240 and 250 or permission.

Soils 480.—J. A. Toogood (0-0; 3-0)

Soil Conservation—Fundamentals of wind and water erosion; conservation practices; erosion and productivity; land use capability; conservation and history.

Prerequisite: Soils 240 and 250 or permission.

Soils 501.

Special Topics and Problems—A course in which the individual is assigned a topic or problem for intensive study and prepares a written report; regular meetings for discussion, and credits up to a maximum of six hours.

Soils 520.—S. Pawluk (0-0; 3-3)

Pedology—Systematics of soil classification throughout the world with special emphasis on distribution, morphology, and physical, chemical and mineralogical characteristics of soils as related to their genesis; application of micro-pedological techniques to the study of soil fabrics; use of aerial photographs for soil mapping purposes.

Prerequisite: Soils 420.

Soils 521—G. R. Webster (3-3; 0-0)

Chemical Methods as Applied to Soil Research—A study of some of the more complex chemical reactions and properties of soil systems and the equipment and techniques used to study them.

Prerequisite: Soils 450 or permission.

Soils 530.—F. D. Cook (3-3; 0-0)

Advanced Soil Microbiology—Microbiology of organic matter decomposition and humus formation; microbiology of nitrogen and mineral transformations, bacteriophages, and predatory microorganisms.

Prerequisite: Soils 430 or permission.

Soils 531.—J. A. Toogood (0-0; 3-3)

Physical Methods as Applied to Soil Research—Physical properties of soils as they relate to mechanical composition, consistency, structure, aeration, tillage, erosion, and other factors affecting plant growth.

Prerequisite: Soils 470 or permission.

Soils 631. (1-0; 1-0)

Seminar—Reports by students and instructors on the literature of selected topics, with class discussion. Required of all graduate students.

STATISTICS

Stat 241—Elementary Probability (0-0; 3-1)

Elementary Probability—Elementary set theory. Finite sample spaces. Probability as a set function. Coditional probability and Bayes' formula. Hypergeometric and binomial distributions. Moments, standardization and the law of large numbers. Density and distribution functions of continuous random variables.- Expectation. Poisson and normal approximations of the binomial distribution.

Prerequisite: Mathematics 240 or equivalent.

Stat 255. (3-3; 3-3)

Elementary Statistics—Graphs, tables, diagrams. Frequency distributions, averages, dispersion, moments. Elementary probability. Binomial, normal and Poisson distributions. Sampling. Regression and correlation. Significance tests. Applications to data in various fields.

Prerequisite: Mathematics 30.

Stat 305. (3-2; 0-0)or(0-0; 3-2)

Introductory Statistics—Tabulation, graphical representation and reduction of data. Measures of location and dispersion. Elementary probability. Binomial and normal distributions. Curve fitting and the chi-square test of goodness-of-fit. Elements of sampling. Testing statistical hypotheses, confidence intervals.

Prerequisite: Mathematics 30.

Stat 341. (3-2; 0-0)

Statistical Methods—Joint density and distribution functions. Central limit theorems and sampling distributions. Point and interval estimation. Desirable properties of estimates. Maximum likelihood estimation. Decision theoretic approach to statistical inference. Hypothesis testing as a two-decision problem, likelihood ration, types of errors, power. Linear models: analysis of variance, regression, multiple comparisons, simple designs.

Prerequisite: Statistics 241.

Stat 450. (3-0; 3-0)

Probability and Statistics—Theory of probability. Distribution functions and characteristic functions. Central limit theorem. Sampling. Exact sampling distributions. Confidence intervals. Maximum likelihood. Methods of least squares. Analysis of variance. Statistical inference.

Prerequisite: Mathematics 304. (Previous completion of Statistics 255, or Biometrics 455 or equivalent, is advisable).

ZOOLOGY

Biol 232

Comparative Zoology—See BIOLOGY.

Zool 320. (2-4; 2-4)

Vertebrate Biology—A general survey of structure and functions of vertebrate animals.

Prerequisite: Biology 230.

VIII

The Faculty of Arts

INFORMATION, REGULATIONS, COURSES

OFFICERS OF THE FACULTY OF ARTS

Dean—D. E. Smith
Assistant Deans—R. G. Motut, J. W. Fishbourne
Faculty Secretary—R. J. Middleditch

Matriculation—Alberta Students

Students from the high schools of Alberta seeking admission to the Faculty of Arts must present a high school diploma with "B" or higher standing in the following courses:

1. English 30
2. Social Studies 30
3. Mathematics 30 (see Note 1.)
4. A language other than English (see Note 2.)
5. Physics 30 or Chemistry 30 or Biology 30 (see Note 3.)
6. A second language (item 4) or a second science (item 5) (see Note 4.) with an average of 60.0% in the required courses. (see Note 6.)

Notes on Matriculation

1. Mathematics 31 also is required for B.A. with Honors in Mathematics.
2. The language other than English normally will be one of French 30, Latin 30 or German 30. However, the Faculty will accept Greek, Italian, Russian or Spanish (at an equivalent level).
   If a second matriculation language is presented, it may be any of the languages mentioned in the preceding paragraph or Ukrainian 30 or any other language (at an equivalent level) provided it is not from the same linguistic group as the first matriculation language.
   Students wishing to present a language not offered in Alberta high schools must submit to the Dean's office evidence of their attainment in that language.
3. Biology 32 will be accepted as a subject of matriculation if taken before September 1965.
4. Applicants who have successfully completed the Grade V Theory examinations of the Royal Conservatory of Music Toronto, or the Grade VII Theory examinations of the Western Board of Music, or the equivalent, may present such qualification in lieu of one of the matriculation options for admission to the B.A., B.F.A., or B.Mus. programs.
5. Candidate for the B.Mus. program must present Grade VIII practical and Grade IV and V theoretical of the Western Board of Music or equivalent.
6. Candidates seeking admission to the B.A.-LL.B. program must present a matriculation average of 65.0% or better.

7. Students whose matriculation credits were secured in 1954 or earlier are given full consideration; they are advised to forward to the Registrar complete transcripts of their high school records.
8. The requirement of a high school diploma may be waived for adult students.

These general regulations nothwithstanding, the University may, at its discretion, refuse admission to any applicant. For example, this right may be exercised in cases where applicants have written an inordinate number of examinations to obtain entrance requirements.

Matriculation—Students from Outside Alberta

Students whose matriculation credits are secured outside Alberta are required to meet standards equivalent to those for Alberta students. They are advised to forward to the Registrar complete transcripts of their high school, or equivalent, records well in advance of the date for registration. A fee of five dollars is charged for evaluating documents originating in Canada and ten dollars if issued in other countries. The University reserves the right to prescribe additional examinations in cases where doubt exists concerning matriculation.

Matriculation Deficiencies

The University offers courses (usually numbered 100) at the grade XII level for students who are beginning their study of a particular subject. In certain circumstances, and only with the permission of the Dean, a student may take one such course to remove a matriculation deficiency, in which case it will not count towards a degree.

Promotion Regulations

Since students' fees cover less than one-quarter of the cost to the Province of their university education, the administration is in duty bound to ensure that only those students remain in the University who make effective use of its facilities. For this reason students' records are carefully reviewed from time to time, and those whose standing is unsatisfactory may be obliged to withdraw from the University.

Detailed regulations regarding promotion from one year to another are found in the general regulations for the honors programs, the general program and for the combined program for the B.A. and LL.B. degrees.

Faculty Regulations

Academic regulations governing students in the Faculty of Arts are contained in this section and in the general section of the Calendar. Regulations applicable to particular programs appear in the sections of the Calendar in which these programs are published. In addition, certain courses are subject to individual prerequisites.

Students are advised to read and consider carefully these regulations and, in cases of doubt as to the precise meaning of any statement or regulation, to consult the office of the Dean or the department concerned.

Limitation on Selection of Courses

Students registered in the Faculty of Arts must select their courses from those set out in the combined Calendar of the Faculties of Arts and Science. In

rare instances, to meet special requirements, the Dean may make exceptions to this regulation.

A student shall restrict his first year registration to junior courses in five different subjects. Senior courses may be taken in the first year only with the consent of the department concerned and the approval of the Dean.

Half-year Courses

A number of courses are offered in one term only; two such courses are recognized as the equivalent of one full course. Where the curriculum requires a full course in a particular subject or division, both courses must be chosen from that subject or division; where the requirement is for an option, any two half-courses may be combined to meet the requirement. Half-year courses are not open to first year students.

PROGRAMS OF STUDY

The Faculty of Arts offers honors programs and a general program leading to the degree of Bachelor of Arts (B.A.), and also programs in the Fine Arts leading to the degrees of Bachelor of Fine Arts (B.F.A.) and Bachelor of Music (B.Mus.). It is associated with the Faculty of Law in a program leading to the combined degrees of Bachelor of Arts and Bachelor of Laws (B.A., LL.B.).

Honors Programs

The honors programs lead to the B.A. degree, with honors in a particular subject or subjects, in four years. They are designed to provide specialization in the chosen subject or subjects together with a longer training than in the general program, as well as the higher standard implied by the term "honors". An honors program may be interrupted only by special permission of the Council of the Faculty.

Some departments provide a special first year for students who wish to take honors, although in most departments the difference between honors and the general program does not appear until the second year. Permission to take first year honors is granted to students with high matriculation standing and with the approval of the department concerned. A request for this privilege should be made on the Application for Admission or through the head of the department not later than the time of registration. A student who, in his first year, fails to attain the standard necessary for continuance in honors must transfer to the general program and subsequently must complete all its requirements. The special first year honors programs are so designed that a student can proceed to a degree in the general program without penalty.

A student need not commit himself to honors in this first year, and may register in an appropriate selection of courses as required by the regulations of the general program. If he obtains a sufficiently high standing in his first year and is recommended by the department concerned, he may enter honors in his second year. A student desiring to do so must apply to the Dean, through the head of the department concerned, preferably during his first year and in any case not later than the time of registration for the second year. Consideration will also be given to applications for transfer to honors submitted by students who have completed the second, or even the third, year of the general program.

Promotion from first year to second year, as well as from second to third and from third to fourth, is by recommendation of the department concerned, for which a grade point average of at least 5.5 is required. A student who is not recommended to continue in honors at the end of his second year will be transferred to the general program, and must select his courses accordingly.

A student who is not recommended to continue in honors at the end of his third year, or who fails to complete the requirements for a degree with honors in his fourth year, may be granted the general degree forthwith, provided that the courses he has taken and the standing attained are satisfactory. Otherwise he may be required to take one or more additional courses in a subsequent summer or winter session. A student who, for any reason, is unable to return to university for the fourth year may apply for a general degree under the same conditions.

In all years a student's program must be approved by his department and by the Dean, and is subject to the following general provisions:

1. A student is not permitted to confine his studies to one discipline; during his first three years he must take at least three courses not closely related to his subject of specialization. For example a student specializing in the Social Sciences is obliged to take at least three courses in subjects classified as Humanities or Natural Sciences; similarly, a student in the Humanities must take at least three courses in the Natural or Social Sciences.
2. In the third and fourth years considerable latitude is permitted in order to meet the needs of individual students. A student may choose to concentrate closely on one subject or to widen his field of study. In the latter case he will not be required to take, over the four years, more than ten courses in the subject of concentration.
3. The term "option", where it appears in the programs, is to be construed as a course freely chosen by the student provided he has the necessary prerequisite. An "approved option" is to be construed as an option approved by the department directing the program of the student concerned.

Degrees with honors are awarded in two classes, first class honors and honors. For first class honors a grade point average of 7.5 is required; for honors, 5.5.

The prescriptions for honors programs are listed with the offerings of individual departments.

THE GENERAL PROGRAM

Attention is directed to the regulation in Part III of this Calendar which makes every student responsible for the completeness and accuracy of his registration. This regulation will be strictly enforced.

To be granted the B.A. degree, a student must present passing marks in a minimum of fifteen full courses, and a grade point average of at least 5.0 in all courses credited towards the degree after the first year. Students transferring to this University with advanced standing will be required to complete at least five of the fifteen courses at the University of Alberta.

The normal program is set out below, i.e., five full courses per year for three years. The Dean may, in exceptional circumstances, permit a student to proceed to a degree over a longer period, or to meet the requirements in a shorter time by attendance at summer session and by taking extra courses during the regular session.

A student will not be allowed to write more than five supplemental examinations for the purpose of obtaining passing marks or of raising his grade point average to the required 5.0. A student may not write more than two supplemental examinations in any year.

A student who is repeating a year will be granted no supplemental privileges in the courses taken that year, and must pass all courses with a grade point average of 5.0 to be allowed to continue in the Faculty of Arts. The privilege of repeating a year will be granted to a student not more than once during his candidacy for a degree in this Faculty, unless by special permission of the Dean.

Requirements for the B.A. in the General Program

First Year

English 200; an Arts course; a laboratory Science course; two options; Physical Education.

Second Year

An Arts course; a Natural Science course; three options.

Third Year

An Arts course; a Natural Science course; three options.

NOTES:

1. Each student must include in his program a minimum of three courses and a maximum of five in a principal subject of concentration, and a minimum of three and a maximum of four in a second subject of concentration.
2. There may not be more than seven junior courses in the program, except by special permission of the Dean.
3. A student registering for the B.A. degree must choose his principal subject of concentration in the humanities or in the social sciences or in mathematics (see Classification of courses, page 53).
4. To be awarded the B.A., the student must present credit in at least eight courses in the humanities and social sciences.
5. Students should study the Advice to General Program Students, which appears under the departmental headings on subsequent pages of this Calendar, and should consult members of the departments offering the courses they choose.

The Degree of Bachelor of Fine Arts (B.F.A.)

Drawing and Painting

First Year

English 200; a foreign language; Art 200; Art 230; Art 240; Physical Education.

Second Year

An Arts or Science option; an approved senior Arts course; Art 300; Art 310; Art 340.

Third Year

An Arts or Science option; Art 330; Art 350; Art 400 or 401; Art 440.

Fourth Year

Philosophy 350; a senior Arts or Science option; Art 430; Art 450; Art 474.

Notes: 1. Admission requirements for the B.F.A. are the same as for the B.A. degree.

2. To be granted the B.F.A. degree a student must present credit in each of the above noted courses, with a grade point average of at least 5.0 in all courses credited towards the degree after the first year.

The Degree of Bachelor of Fine Arts (B.F.A.)

Drama

First Year

English 200; Drama 240; Drama 250; Drama 270; French 200, or an approved foreign language course; Physical Education.

Second Year

Drama 300 or 400; Drama 350; Drama 390; English 332; an approved Arts or Science option or Drama 340; an approved Arts option.

Third Year

Drama 300 or 400; two of Drama 370, 450, 460, 480; Drama 490; an approved course in Psychology; an approved senior Arts option.

Fourth Year

Drama 590; Philosophy 350; one of Drama 470, 550, 580; a senior Drama course; an approved Art or Music course; an approved senior Arts option.

Notes: 1. Admission requirements for the B.F.A. in Drama are the same as for the B.A. degree.

2. To be awarded the B.F.A. degree, a student must fulfil the following requirements, in addition to presenting passing marks in each of the above courses:
   (a) Obtain a grade point average of 5.0 in all courses credited to the degree program after the first year;
   (b) Complete at least two regular sessions, i.e. full year's program, including their first year in the B.F.A. program at the University of Alberta.

3. After the second year, specialization will be required in one of: Acting, Directing, or Design and Technical Practice.

The Degree of Bachelor of Music (B.Mus.)

Candidates for the B.Mus. degree may choose one of three areas of study:

1. Theory and Composition
2. Applied Music (1) Piano
   (2) Orchestral Instrument
   (3) Voice
   (4) Organ
3. Church Music

Candidates wishing to register in any one of the above programs must have completed Grade VIII Practical and Grades IV and V Theoretical of the Western Board of Music or offer equivalent standing. Matriculation requirements are as for the B.A. degree.

In addition to the course requirements in each of the *four years,* certain other requirements apply. These are:

1. All candidates for the B.Mus. degree must complete one of Latin, Italian, French, German or Russian as one of their options.
2. Options must be approved by the Department and must include at least one senior course.
3. Candidates in *Applied Music* may be required to present a senior and/or a junior recital before graduation.
4. Candidates in *Applied Music* who choose Piano as their First Practical Subject must choose a Second Practical Subject in consultation with the Head of the Department.
5. Candidates in *Applied Music* who choose an Orchestral Instrument or Voice as their First Practical Subject must choose Piano as their Second Practical Subject.
6. Candidates in *Church Music* must choose Organ as their First or Second Practical Subject.
7. Candidates in *Theory and Composition* must achieve the standard of Grades VII and X of the Western Board of Music in their Second and First Practical Subject respectively by the end of their third year of study.
8. Candidates in *Church Music* must achieve the standard of Grades VII and XI of the Western Board of Music in their Second and First Practical Subject respectively by the end of their third year of study.
9. Candidates in *Applied Music* must achieve the standards of Grades VII and XI of the Western Board of Music in the second and First Practical Subject respectively for Teachers, and Grades VII and XII for Performers, by the end of their fourth year of study.
10. Candidates in *Orchestral Instruments* may qualify for the B.Mus. degree by studying one of the following as their First Practical Subject:
    Violin, Viola, 'Cello, Double Bass;
    Flute, Oboe, Clarinet, Saxophone, Bassoon;
    Trumpet, French Horn, Trombone (Tuba); Harp,
    Percussion.

Details of the programs are as follows:

Bachelor of Music in Theory and Composition

First Year

English 200; Music 203; Music 215; Music 225; Music 250; Music 260; Physical Education.

Second Year

Music 303; Music 315; Music 325; Music 352; Music 353; Music 360; an approved option.

Third Year

Music 403; Music 415; Music 425; Music 452; Music 453; Music 460; an approved option.

Fourth Year

Music 552; Music 553; Music 554; Music 555; Music 560; two approved options.

Bachelor of Music in Applied Music

First Year

English 200; Music 200; Music 215; Music 225; Music 250; Physical Education.

Second Year

Music 301; Music 315; Music 325; Music 352; Music 353; an approved option.

Third Year

Music 401; Music 415; Music 426; Music 450; Music 452; an approved option.

Fourth Year

Music 515; Music 526; Music 527; Music 552; two approved options.

Bachelor of Music in Church Music

First Year

English 200; Music 203; Music 215; Music 225; Music 233; Music 250; Physical Education.

Second Year

Music 303; Music 315; Music 325; Music 333; Music 352; Music 353; an approved option.

Third Year

Music 403; Music 415; Music 425; Music 433; Music 450; Music 452; an approved option.

Fourth Year

Music 412; Music 528; Music 552; Music 555; two approved options.

Combined Course leading to the Degrees of B.A. and LL.B.

In the first and second years of the combined program, students register in the Faculty of Arts; those who are promoted at the end of the second year will transfer to the Faculty of Law. During the first two years the program is administered by an interfaculty committee consisting of the following members: Professor F. D. Blackley, Chairman; Professor J. W. Bilsland (Arts), Professor W. F. Dawson (Arts), Professor A. Smith (Law) and Dean Penelhum (Arts and Science, Calgary.)

Matriculation requirements are as for the B.A. degree, but with an average of 65%.

First Year

English 200; French 200 or German 200 or Latin 200; a science or mathematics or statistics course; two of Economics 200, History 200, Philosophy 240 or Political Science 200; Physical Education.

Second Year

Five approved Arts courses (See "Notes" below.)
(No student may enter the second year of the combined course unless he has successfully completed the first with a grade point average of not less than 5.0.)

Third Year

The prescription for first year Law; one approved senior Arts course.
(Promotion from the second to the third year of the combined course is contingent upon a grade point average of at least 5.0 in the second year, and a grade point of 6 in at least four courses, two of which must be in the second year.)

Fourth Year

The prescription for second year Law.
(The degree of B.A. may be granted at the end of the fourth year.)

Fifth Year

The prescription for third year Law.

Notes on B.A.-LL.B. Course Selection

1. The courses of the first two years of the combined program must include a major concentration of three courses in one of Economics, English, History, Philosophy or Political Science, and a minor concentration of two courses in a second subject, not necessarily one of these.
2. The program must include at least one approved course in either Canadian History or Canadian Government, and at least one approved course in British Constitutional History or British Government; these courses may, but need not, be included in either the major or minor concentration.
3. Approval of Arts options must be obtained from the Chairman of the B.A.-LL.B. Committee, Professor F. D. Blackley, Department of History.

Requirements for B.A. after B.Ed.

Holders of the B.Ed. degree, whose programs include thirteen Arts and Science courses, may qualify for the B.A. degree by completing a six course program as prescribed by the Faculty of Arts. Those with fewer than thirteen Arts and Science courses will be required to take additional courses.

Requirements for B.A. after B.Sc.

Students who have qualified for the degree of B.Sc. may proceed to the degree of B.A. by completing a 9-course program as prescribed by the Faculty of Arts.

Pre-Professional Requirements—Faculties of Medicine and Dentistry

Admission to the Faculties of Medicine and Dentistry is contingent upon the successful completion of two years of University study and the presentation of full university courses in organic chemistry, inorganic chemistry, physics and zoology. Students who register in the Faculty of Arts in order to meet these requirements should include in their programs Chemistry 230 and 350, Physics 100 or 200 or 240 and Biology 230 or equivalent.

Graduate Studies

A student wishing to pursue work towards the Master's or Doctor's degree should consult the Calendar of the Faculty of Graduate Studies.

Classification of Courses

Courses offered in the Faculties of Arts and Science are classified as follows:

Humanities

Art
Classics 240, 350, 351, and 354
Comparative Literature
Drama
English
French
German
Greek
Hebrew (St. Stephen's College)
Household Economics 350
Italian
Latin
Linguistics
Music
Old and New Testament Literature
Polish
Russian
Scandinavian
Spanish
Ukrainian

Social Sciences

Anthropology (excl. 390)
Classics 352, 353, 356, 358 and 395
Christian Apologetics 366 (St. Joseph's College)
Economics
Education
Geography courses listed in the Arts section of the Calendar.
History
Philosophy
Political Science
Psychology courses listed in the Arts section of the Calendar
Sociology (excl. 311)

Natural Sciences

Anthropology 390
Astronomy
Bacteriology
Biochemistry
Biology
Botany
Chemistry
Computing Science
Entomology
Genetics
Geography courses listed in the Science section of the Calendar
Geology
Mathematics
Microbiology
Physical Science
Physics
Physiology
Plant Biochemistry and Physiology
Psychology courses listed in the Science section of the Calendar.
Sociology 311
Statistics
Zoology

NOTES: 1. Instructors are listed by departments. The rank in each case is that held in January, 1966.

2. The hours of instruction for both terms of the winter session are shown at the top of each course description. The letter "L" attached to a figure signifies lecture-laboratory hours, and the letter "s" seminar hours. The symbol 3/2 means three hours in alternate weeks. Unless otherwise specified, the first figure in each term indicates lecture hours and the second laboratory hours.

3. Courses numbered 100 to 299 inclusive, described as junior, are open to first year students, and, in some circumstances, are also available as options in senior years. Courses numbered 300 to 499, described as senior, are primarily for students beyond the first year at University. Those numbered 500 or higher are open to honors and graduate students. For further information, particularly in the matter of prerequisites, students are advised to consult the section of the calendar containing detailed descriptions of courses.

The University reserves the right to modify or withdraw for the session any of the courses here outlined.

ACCOUNTING

Instruction offered by members of the Faculty of Business Administration and Commerce.

Acctg. 202. (0-0; 3-2)or(3-2; 0-0)

Fundamentals of Accounting—The language of accounting, forms of business organizations, preparation of financial statements.

Acctg. 204. (0-0; 3-2)or(3-2; 0-0)

Management Accounting—Interpretation of financial statements stressing managerial requirements.

Prerequisite: Accounting 202 or equivalent.

NOTE: Open to B.A. or B.Sc. students only if they are concentrating in economics and have permission of their Dean.

ANTHROPOLOGY

See Sociology and Anthropology

ART

Associate Professors—J. A. Forbes, J. B. Taylor (Acting Head), E. N. Yates.
Assistant Professors—J. Knowlton, J. Moore, B. Pragnell.
Lecturer—R. W. Sinclair.

Advice to General Program Students

The Division of Art places no restrictions upon the choice of Art courses other than those imposed by prerequisite requirements and Faculty regulations.

Junior Courses—

Art 200. (3-0; 3-0)

Introduction to the History of Art—Beginning with a discussion of fundamental concepts underlying painting and the plastic arts, this course investigates the major styles and contributions of each important period.

Art 230. (1-4; 1-4)

Fundamentals of Design—The study and practical application of principles of composition and picture-making, methods of construction in design, and the use of conventional and abstract forms.

Art 240. (3-3; 3-3)

Fundamentals of Drawing—Theory and practice of drawing, analysis of masters' drawings, study of line, form, light and shade; portrait and figure construction; life drawing, using both long and quick poses.

Senior Courses—

Art 300. (3-0; 3-0)

History of European Art, 3rd to 17th Century—A more detailed study of early Christian, Byzantine, Medieval and Renaissance periods of European Art.

Art 310. (3-3; 3-3)

Fundamentals of Painting—Theory and practice of painting in oils; forms in space; analysis of line and form in painting; study of arrangements, both two-dimensional and three-dimensional; use of light and shade; application of pigments in both monochrome and color.

Prerequisite: Art 240.

Art 330. (2-3; 2-3)

Advanced Composition I—Analysis of master compositions from the various schools of painting; theory and practice in arranging forms, both in the two-dimensional and in space; exercises in figure grouping; studies in non-figurative composition including an introduction to graphic design.

Prerequisite: Art 230 and Art 240, or consent of department

Art 340. (2-3; 2-3)

Advanced Drawing I—Portrait and life drawing; drawing from memory and visualization; some anatomical drawing; designing from the figure and the draped model in terms of two-dimensional and three-dimensional form; techniques, line, brush, wash, etc.

Prerequisite: Art 240 or consent of department.

Art 350. (2-3; 2-3)

Advanced Painting I—Painting from the model; portrait, figure and costume. Life size painting chiefly in oils using sustained figure poses.

Prerequisite: Art 310.

Art 400. (3-0; 3-0)

European Art, 17th to 19th Century—A study of the French, Flemish, Dutch, Spanish, German and English schools from 1600 to the middle of the 19th century.

Art 401. (3-0; 3-0)

Twentieth Century Art—The development of painting, sculpture and architecture from mid-19th century to present times.

Art 430. (3-3; 3-3)

Advanced Composition II—Continuation of Advanced Composition I, including some graphics, painting techniques and plastic design.

Prerequisite: Art 330.

Art 440. (3-3; 3-3)

Advanced Drawing II—Continuation of Advanced Drawing I.
Prerequisite: Art 340.

Art 450. (2-4; 2-4)

Advanced Painting II—Painting from the model; portrait, figure and costume; lectures on painting techniques used by the masters of the Renaissance and modern schools; theory and practice of applying pigments on various grounds in both the direct and indirect methods.
Prerequisite: Art 350.

Art 474. (3-3; 3-3)

Advanced Drawing III—Continuation of Advanced Drawing II.
Prerequisite: Art 440.

CLASSICS

Associate Professors—R. J. Buck (Head), E. C. May, Margery W. MacKenzie.
Assistant Professors—R. E. Braun, G. Hermansen, T. Kelly, R. F. Kotre, R. C. Smith.

Honors Programs

A statement will be found below of the general schemes of courses required to obtain honors in this Department. It is not implied that these schemes must be rigidly followed: the Department is prepared to discuss with prospective or actual students reasonable equivalents designed to meet special needs or desires of the persons concerned. In the courses dealing with the literary history, the economic and political history, and the private life of the classical peoples, oral examinations may at any time replace written tests.

Students must consult the Department before choosing their courses and obtain departmental approval before registering.

Honors in Classics

Programs in this field require at least five courses beyond the 100 level in the classical language chosen as a major; three or four courses beyond the 100 level in the classical language chosen as a minor; Classics 352 and 353 or 358 (Greek and Roman History); and eight or nine options, one of which must be a Science course which should be taken in the first year, for a total of twenty courses. Study of at least one year of French or German is strongly recommended. Some of the optional subjects will be integrated with the program, while others should be general options.

Honors in Classics, Ancient History and Classical Archaeology

Programs in these fields require at least four of Classics 352, 353, 354, 356, 358, 395; three courses in Greek *plus* Greek 518 or 519 or 521 and 522; four courses in Latin; eight options, one of which must be a Science course in the first year, for a total of twenty courses.

Honors in Latin or Greek with an Approved Second Subject

A degree with Honors will be awarded in Latin or Greek with an approved second subject, such as English, French, German, Russian, Philosophy, etc.

Programs in these fields require at least five courses beyond the 100 level in Latin or Greek; at least four in the second subject; Classics 350 (Greek Life and Letters); Classics 351 (Latin Literature in Translation); *either* Classics 352 (Greek History), if the major language is Greek *or* Classics 353 or 358 (Roman History), if the major language is Latin; and eight options, one of which must be a Science course which should be taken in the first year, for a total of twenty courses. Programs will be arranged in consultation with the other departments concerned.

Combined Honors (Latin and French, Latin and English, etc.)

A degree with Honors in Latin and French, Latin and English, Latin and German, Latin and Russian, or Greek and Philosophy may be awarded to students following a program of studies similar to the one outlined for Honors in Latin and Greek, except that the number of senior courses in each Honors subject will be as nearly equal as possible (normally five each) and will be selected in accordance with departmental requirements. Approval of both departments concerned is required before registration.

Advice to General Program Students

Both Greek and Latin may be begun at the University (Greek 100 and Latin 100). The course for students who enter the University with Latin 30 is normally Latin 200. From Greek 100 a student proceeds in his second year to Greek 300 and from Latin 100 to Latin 200 or Latin 300 depending on his standing. From Latin 200, a student goes forward to either Latin 300 or one of Latin 372, 373, 374, 375. It is possible for a general program student to take four courses in Latin and four in Greek.

General program students interested in combining a knowledge of the ancient world with a comparison of its cultures to modern civilization may form an area of concentration by making a selection from the courses offered by the Department in Early Civilization, Greek and Roman History, Ancient Art, and Greek and Latin Literature in translation.

LATIN

Junior Courses—

Latin 100. (5-0; 5-0)

Beginners' Latin—This course is to enable students who enter the University without Latin to begin the study of this language in university. It is concerned with the essentials of grammar, syntax, the reading of easy Latin and prose composition. A secondary emphasis is placed on the connexion of English with Latin.

Latin 200. (3-0; 3-0)

Latin Authors and Prose Composition—This course is for students with matriculation in Latin 30 or with Latin 100. It is concerned with improvements in the reading of Latin and with the writing of simple Latin sentenes.

Senior Courses—

Latin 300. (3-0; 3-0)

Latin Authors and Prose Composition—Sight translation and principles of language. For students proceeding from Latin 200.

Latin 372. (3-0; 3-0)
Livy, Vergil and Pliny—Selections from Livy, *History of Rome;* Vergil, *Aeneid* and Pliny,*Letters.*

Latin 373. (3-0; 3-0)
Horace, Tacitus and Juvenal—Horace, *Satires;* Tacitus, *Annals,* I-IV, Juvenal, *Satires.*

Latin 374. (3-0; 3-0)
Cicero, Horace, Sallust—Cicero, *Pro Lege Manilia;* Horace, *Odes;* Sallust, *Catilina.*

Latin 375. (3-0; 3-0)
Plautus, Terence, Vergil—Plautus, *Menaechmi;* Terence, *Adelphoe;* Vergil, *Aeneid,* Book VI.

Honors and Graduate Courses—

Latin 501. (3-0; 3-0)
Cicero

Latin 502. (3-0; 3-0)
Roman Comedy

Latin 503. (3-0; 3-0)
Epic and Didactic Poetry

Latin 505. (3-0; 3-0)
Vergil, Complete Works

Latin 506. (3-0; 3-0)
Sanskrit

Latin 507. (3-0; 3-0)
Petronius, Apuleius

Latin 508. (3-0; 3-0)
Tacitus

Latin 509. (3-0; 3-0)
Roman Elegiac Poets

Latin 510. (3-0; 3-0)
Roman Satire

Latin 511. (1-0; 1-0)
Advanced Latin Prose Composition

Latin 513. (3-0; 3-0)
Latin Lyric Poetry

Latin 517. (3-0; 3-0)
Studies in Latin Literature

Latin 531. (3-0; 0-0)or(0-0; 3-0)
History of the Latin Language

Latin 532. (3-0; 0-0)or(0-0; 3-0)
Latin Epigraphy

Latin 533. (3-0; 0-0)or(0-0; 3-0)
Latin Palaeography

Latin 534. (3-0; 0-0)or(0-0; 3-0)
Medieval Latin

GREEK

Junior Courses—

Greek 100. (5-0; 5-0)
Beginners' Greek—An introductory course to enable students to begin Greek at University. It is concerned with essential grammar and vocabulary, the reading of easy Greek and simple sentences for translation into Greek.

Senior Courses—

Greek 300. (3-0; 3-0)
Greek Authors and Prose Composition—Sight translation. Review of Greek forms. More difficult sentences for translation into Greek. The course follows Greek 100.

Greek 381. (3-0; 3-0)
Herodotus, Aristophanes and Menander—Herodotus, *History;* Aristophanes, *Frogs;* Menander, *Dyskolos.*

Greek 382. (3-0; 3-0)
Thucydides, Euripides, Plato—Thucydides, Book I; Euripides,*Medea;* Plato, *Apology.*

Greek 383. (3-0; 3-0)
Plato, Sophocles, Aristophanes—Plato, *Republic,* Books I-II; Sophocles, *Antigone* (Oxford Classical Text); Aristophanes, *Birds* (Stanford: Macmillan).

Greek 384. (3-0; 3-0)
Aeschylus, Demosthenes, Thucydides

Greek 385. (3-0; 3-0)
Koine Greek—Reading and literary studies in the New Testament, the Church Fathers and other Koine writings. Prerequisite or co-requisite; Greek 381 or 382 or 383 or 384.

Honors and Graduate Courses—

Greek 501. (3-0; 3-0)
Plato and Aristotle

Greek 502. (3-0; 3-0)
Homer, Iliad

Greek 503. (3-0; 3-0)
Greek Lyric Poetry

Greek 505. (3-0; 3-0)
Greek Comedy

Greek 506. (3-0; 3-0)
Greek Orators

Greek 507. (3-0; 3-0)
Greek Tragedy

Greek 508. (3-0; 3-0)
Thucydides

Greek 509. (3-0; 3-0)
Hellenistic Poetry

Greek 511. (1-0; 1-0)
Advanced Greek Prose Composition

Greek 517. (3-0; 3-0)
Studies in Greek Literature

Greek 518. (3-0; 3-0)
Readings in Hellenistic History

Greek 519. (3-0; 3-0)
Readings in Greek History

Greek 521. (3-0; 0-0)or(0-0; 3-0)
History of the Greek Language—Prerequisite: Greek 300 or equivalent.

Greek 522. (3-0; 0-0)or(0-0; 3-0)
Greek Epigraphy—Prerequisite: Greek 300 or equivalent.

Greek 620. (3-0; 3-0)
The Greek and Latin Epigram

SURVEY COURSES IN THE LIFE AND THOUGHT OF THE ANCIENT WORLD

Class. 240. (3-0; 3-0)
Greek Mythology and Religion—A study of Greek religion and mythology from the Minoan-Mycenaean origins to the Hellenistic period with some reference to the Romans. Readings in translation from various ancient authors as well as from modern scholarly works.

Class. 350. (3-0; 3-0)
Classics in English (Greek). Greek Literature and Life—An historical and critical study of Greek literature in translation from Homer to the end of the ancient world. The social, artistic, and cultural background will be examined. The course will be illustrated from the department's collection of slides, films, photographs and reproductions.

Class. 351. (3-0; 3-0)
Classics in English (Latin)—The civilization of ancient Rome as seen through its own literature. Plays, poetry, letters and speeches, read in English translation, and supplemented by slides, create a picture of the Roman world.

Class. 352. (3-0; 3-0)
History of Ancient Greece: The Influence of the Greek Genius on the Western World—The story of the Hellenic world from its beginnings in the

Minoan-Mycenaean civilizations of Crete and Greece until the time of Alexander the Great with special attention to the political organization of the city-state and the beginnings of democracy, and to cultural and economic development.

Class. 353. (3-0; 3-0)

Roman History: The Roman Genius in the Mediterranean World—A study of the Roman Republic and its expansion from city-state to empire. Particular attention will be given to the Roman methods of organization, law and government, and to the way in which the Romans impressed their culture on the Mediterranean world and on Western Europe.

Class. 354. (3-0; 3-0)

History of Ancient Art—A history of the rise and progress of ancient art from the Cretan period through the Graeco-Roman age. An examination of the aims and principles underlying ancient art. The course will be fully illustrated from the department's collection of slides and photographs.

Class. 356. (3-0; 3-0)

Early Civilization—A survey of the beginnings and development of civilization in the Mediterranean and Near Eastern areas. Particular attention will be paid to Ancient Egypt, the Fertile Crescent, the Assyrian and Persian Empires, the Phoenicians and Hebrews, the Hittites, Troy, Crete and prehistoric Greece.

Class. 358. (3-0; 3-0)

History of the Roman Empire—A study of the Roman Empire and its rule over the Mediterranean world. Particular attention will be paid to imperial government, law and civilization; to the decline and fall; and to the influence on Byzantine and western European culture.

Class. 395. (3-1; 3-1)

Prehistoric Archaeology—Archaeology as the anthropological approach to reconstruction and study of extinct, non-literate societies; archaeological techniques, methods and modes of interpretation; comparative analysis of the major prehistoric developments of the world.

Prerequisite: A course in Anthropology, or Classics 356, or consent of department.

NOTE: The same as Anthr 395.

COMPARATIVE LITERATURE

Instruction offered by members of the Departments of Classics, English, Germanic Languages and General Linguistics, Romance Languages and Slavonic Languages and Literatures.

Before registering for these courses, students must consult the Interdepartmental Committee on Comparative Literature Studies, through one of the above departments, to ensure that they are qualified to undertake the work.

Honors and Graduate Courses—

C.Lit. 505. (3-0; 3-0)

The Theory of the Study of Literature

C.Lit. 507. (3-0; 3-0)

Literary Stylistics—A comparative study of the various schools and trends of contemporary literary stylistics (psychological, aesthetic, linguistic, quantitative stylistics) together with an analysis of specific stylistic devices on the basis of literary texts.

C.Lit. 510. (3-0; 3-0)

Poetics: The Nature and Forms of Poetry—A systematic study of the structures of poetry at all levels of the expression and the content (meter, genre, diction, syntax, imagery, topoi, motifs, and specific subject matter) with particular attention to their development and use through the Western tradition, ancient and modern.

Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C.Lit. 530. (3-0; 3-0)

Comparative Studies in European Drama of the Sixteenth and Seventeenth Centuries

Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C.Lit. 550. (3-0; 3-0)

Comparative Studies in Romantic Literature

Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C.Lit. 555. (3-0; 3-0)

Comparative Studies in Literature of the late Nineteenth Century

Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C.Lit. 620. (3-0; 3-0)

Comparative Slavonic Literature

Prerequisite: Evidence of a competent reading knowledge of two Slavonic languages.

C.Lit. 640. (3-0; 3-0)

Socialist Realism: Theory and Practice—A critical survey of the theory of socialist realism against the background of American and West European literary theory together with an analysis of Soviet and Western literary texts commonly labeled socialist realist.

Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

(This course is also listed as Slavonics 640.)

C.Lit. 649. (3-0; 3-0)

Franco-German Literary Relations during the Nineteenth Century

C.Lit. 695. (3-0; 3-0)

Anglo-German Literary Relations from the Sixteenth to the Nineteenth Century

DRAMA

Professor—G. B. Peacock (Head).
Associate Professors—F. F. Bueckert, J. H. Terfloth.
Assistant Professors—B. Engel, L. Feldman, C. T. Peacocke.

Advice to General Program Students

Students choosing Drama as a subject of concentration should take Drama 250 as a first course. Subsequent courses in Drama should be selected in consultation with the Department.

Junior Courses—

Drama 210. (3-0; 3-0)

Introduction to Theatre Art—An exploration of various collaborative arts involved in theatrical production. An introduction to aspects from which the theatre may be approached—for example; acting, directing and design, criticism and playwriting.

Drama 240. (3-0; 3-0)

Voice and Speech—An intensive course in voice and speech improvement with an emphasis upon the oral interpretation of prose, poetry and dramatic literature.

Drama 250. (3-2; 3-2)

Acting Technique and Production—

(a) Acting: Practical and theoretical work through improvisation, stage performance and discussion. Emphasis is placed on the development of the actor through preparation for a role, acting scenes, and basic voice and body work. Elementary makeup.

(b) Production: Assignments in technical practice.

Drama 270. (2-3; 2-3)

Stagecraft—Construction and handling of scenery and properties, lighting and sound, costumes, elements of production, planning, backstage organization; practical work in construction and crew performance for major productions.

Senior Courses—

Drama 300. (3-0; 3-0)

The History of the Theatre—Survey of theatrical and dramatic history from the Greeks to the middle of the nineteenth century. Extensive readings in the dramatic literature of the various periods.

Drama 340. (3-1; 3-1)

Advanced Voice and Speech—Advanced phonetics and oral interpretation with emphasis upon the actors' speech needs.

Prerequisite: Drama 240.

Drama 350. (2-4; 2-4)

Advanced Acting—

(a) Further study and exercises in character creation, voice production, development of acting techniques.

(b) 1. Practical work in major productions and one-act plays.
2. Advanced training in contemporary styles of acting.
Prerequisite: Drama 250.

Drama 370. (2-3; 2-3)
Design for the Theatre—Beginning scene, light and costume design. A study of the principles of design in relation to limitations of the stage; an investigation of historical styles that have affected modern scene design.
Prerequisite: Drama 270.

Drama 390. (1-4; 1-4)
Production Techniques—Planning for major productions with members of the class responsible for planning and supervising crew work in construction, lighting, costuming, makeup and sound.
Prerequisite: Drama 270.

Drama 400. (3-0; 3-0)
The Modern Theatre—The development of the modern theatre from Ibsen to the present day. The aesthetics of the theatre. A considerable amount of outside reading will be assigned throughout the year, including the reading of plays and critical essays.

Drama 450. (2-3; 2-3)
Styles of Acting—Study and performance in the main period styles of acting.
Prerequisite: Drama 350.

Drama 460. (3-0; 3-0)
Playwriting—Study of and practice in playwriting.
Prerequisite: English 200 and consent of the Department.

Drama 470. (2-4; 2-4)
Advanced Design and Technical Practice—Individually assigned problems covering responsibilities of stage designer; practical work in advanced stagecraft; required practical design and technical work in productions.
Prerequisite: Drama 370.

Drama 480. (3-2; 3-2)
Directing Techniques—
(a) A study of the problems of play selection, casting, preparation of a script and conduct of rehearsals; techniques involved in production.
(b) Practical
1. Each member of the class is given the opportunity to work with the director of a major production in a responsible capacity.
2. In the second term each member of the class will be responsible for the preparation of a complete director's script.
Prerequisite: Drama 250.

Drama 490. (0-4; 0-4)
Advanced Production—Advanced practical study in one of three fields—Acting, Directing or Design.
Prerequisite: Drama 390 or 450 or 480.

Drama 550. (2-4; 2-4)

Advanced Acting—Assignments in major roles for public performance.

Prerequisite: Drama 450.

Drama 580. (2-4; 2-4)

Advanced Directing—Studies in play directing with analysis and practical work in the staging of plays of different types and styles.

Prerequisite: Drama 480.

Drama 590. (0-6; 0-6)

Production Thesis—A completely developed production book including a major paper on one of the following aspects of production: acting, directing, design or technical practice. The thesis may be based on an actual or a theoretical production.

Prerequisite: One of Drama 470, 550 or 580.

ECONOMICS

Professors—W. D. Gainer (Head), E. J. Hanson.

Associate Professors—M. F. Bauer, E. Berg, R. Cirillo, Z. Konczacki, I. Moravcik, T. L. Powrie, M. D. Stewart.

Assistant Professors—A. Buse, J. J. Delehanty, E. Drugge, M. S. Noorzoy, R. Pendergast, V. Salyzyn, C. Steinberg, A. A. Warrack.

Special Lecturers—Mrs. K. W. Klawe, C. C. Nunn.

Honors in Economics

First Year

Economics 200; English 200; a laboratory science; two approved options; Physical Education.

Second Year

Economics 300; Economics 380; an approved course in Statistics; an approved course in Mathematics; an approved option.

Third Year

Two courses in Economics; three approved options.

Fourth Year

Three courses in Economics including Economics 404 if not taken previously and a course in the 500 range; two approved options.

NOTE: Two of the approved options somewhere in the program must include courses in a modern language other than English (preferably French, German or Russian—either two courses in one language or one course in each of two languages. Accounting 202 and 204 together are acceptable as an option at any stage in the program as are additional courses in Economics. However, the student will not receive advance credit in an M.A. program at this University for more than nine Economics courses taken in the undergraduate program.

Students in the general program who elect the five-course sequence of concentration in Economics and who may wish to transfer to the Honors program later should select Economics 300 and 380 in their program as well as the appropriate courses in Modern Languages, Statistics and Mathematics.

Students wishing to undertake a program of Slavonic and Soviet studies may register for Honors in Economics. By choosing options according to the program requirements set out by the Interdepartmental Committee on Soviet and Slavonic Studies, a student may qualify to have the notation "Slavonic and Soviet Studies" added to his record upon satisfactory completion of his program.

Advice to General Program Students

The following sequences are recommended to students who select Economics as a subject of concentration:

Three-course sequence: Economics 200 and two senior Economics courses.

Four-course sequence: Economics 200, 301 and two other senior Economics courses.

Five-course sequence: Economics 200, 300, 380 and two other senior Economic courses.

General program students who may wish to transfer to the Honors program or to proceed later to graduate study in Economics should consult the Department. Such students are reminded that basic courses in Calculus and Statistics are prerequisite to graduate work in Economics at this University.

Junior Courses—

Econ. 200. (3-0; 3-0)

Principles of Economics—A survey of various aspects of economics; the nature of economic problems and systems; the functions of money; commercial and central banking; national income analysis; monetary and fiscal policy; pricing under competitive and monopolistic conditions; selected topics in analysis and policy.

Prerequisite for all senior Economics courses except 305, 310, and 311.

Senior Courses—

Econ. 300. (3-0; 3-0)

Micro-Economic Analysis—The theory of consumer behavior; price and output determination under competition, monopoly and other market structures; the allocation of resources and resource pricing; the distribution of income.

Prerequisite: Economics 200 or 302.

(NOTE: Not to be taken by students who have credit in Economics 301.)

Econ. 301. (3-0; 3-0)

Intermediate Economic Theory—Micro- and macro-economic analysis; the principles of price and output determination in product and factor markets; the theory of national income and product determination.

Prerequisite: Economics 200 or 302.

(NOTE: Not to be taken by students who have credit in Economics 300 or 380.)

Econ. 305. (3-0; 3-0)

General Economics—An introduction to economic principles, problems and policies with emphasis on the Canadian experience.

(NOTE: Open only to senior students who do not hold credit in Economics 200 or 302.) This course is not a prerequisite to any other Economics course.

Econ. 310. (3-0; 3-0)

Canadian Economic Development—The relative growth of various industries and the regional distribution of economic activity with emphasis on the role of export staples, technology, capital accumulation and government.

Econ. 311. (3-0; 3-0)

Western European Economic Development—The development of the economy of Western Europe since the middle ages with emphasis on economic change in the United Kingdom, France and Germany.

Econ. 320. (3-0; 3-0)

International Economics—The basis of international trade, balance of payments problems, and related matters are analyzed theoretically and in relation to questions of economic policy. The development of the international economy since 1500 is surveyed, with emphasis on events since the Second World War.

Prerequisite: Economics 200 or 302.

Econ. 330. (3-0; 3-0)

Labor Problems—A survey of the nature of labor economics and labor problems, including the various approaches of organized workers and employers to these problems. The approach of government to labor problems, including industrial disputes and social security. Applications of economic analysis to wages, unemployment and related problems.

Prerequisite: Economics 200 or 302.

Econ. 340. (3-0; 3-0)

Money and Banking—The principles of money, monetary systems, commercial banking, central banking, monetary theory and policy, foreign exchange.

Prerequisite: Economics 200 or 302.

Econ. 350. (3-0; 3-0)

Public Finance—A study of the conditions under which individual economic goals can be maximized through non-market mechanisms. Problems in the allocation of resources, redistribution of income, and stabilization of the level of resource utilization. A frame-work for analyzing taxes and the goals of a tax system. Patterns and trends in government expenditure and revenues. Objectives, principles, and techniques of compensatory fiscal and debt policies.

Prerequisite: Economics 200 or 302.

Econ. 367. (3-0; 0-0)

Economics of Agriculture—An introduction to the nature and scope of agricultural economics; economic aspects of agricultural production, marketing, finance, resource use, prices, and policy; relation of the agricultural sector to the economy as a whole; analysis of structural change, economic growth and adjustment in agriculture.

Prerequisite: Economics 200 or 302.

(NOTE: This course is also listed as Agricultural Economics 367 in the Faculty of Agriculture and is not open to students who have credit for that course or for Agricultural Economics 303.)

Econ. 368. (0-0; 3-0)

Economics of World Agriculture—A survey of the world structure of agricultural production, consumption, and trade; international agricultural policies and agreements; impact of regional economic integration on agriculture; interrelation of economic development and trade in agricultural commodities.

Prerequisite: Economics 200 or 302.

(NOTE: This course is also listed as Agricultural Economics 368 in the Faculty of Agriculture and is not open to students who have credit for that course.)

Econ. 372. (3-0; 3-0)

Industrial Organization—An examination of problems arising from business concentration in an enterprise economy. Conflicting goals of public policies. Analysis of the behaviour and performance of firms in different market structures in Canada and the United States, to include such topics as problems in defining the market, types and importance of barriers to new competition, and determining the optimum level of competition. Common law foundations of public policies towards business concentration. Problems of interpreting, administering, and enforcing anti-combines legislation in selected cases. Special topics of interest to the class.

Prerequisite: Economics 200 or 302; Economics 300 recommended.

Econ. 380. (3-0; 3-0)

Macro-Economic Analysis—National income concepts and determination; the theory of aggregate consumption and investment; business cycle and growth applications of aggregate analysis.

Prerequisite: Economics 200 or 302.

(NOTE: Not to be taken by students who have credit in Economics 301.)

Econ. 390. (3-0; 3-0)

Comparative Economic Systems—A comparative study of the institutions and theories of important contemporary systems of economic organization, with emphasis on the "mixed" capital system, "command" economies of the Soviet type, and transitional systems embodying socialist as well as capitalist principles. A survey of socialist economic throught with emphasis on the economics of Marx.

Prerequisite: Economics 200 or equivalent or consent of the Department.

Econ. 391. (3-0; 3-0)

The Soviet Economy—The development and institutional arrangements of the Soviet economy; Marxian economics and Soviet economic policies; central planning of economic activity; Soviet economic performance and its evaluation.

Prerequisite: Economics 200 or equivalent or consent of the Department.

Econ. 400. (3-0; 3-0)

History of Economic Theory—A survey of economic opinions and theories from ancient times to the present. Topics include the medieval just price, mercantilism, the Physiocrats, classical and Marxian economics, and the contributions of Marshall and Keynes. The emphasis is not on the detailed technical content of economic theories, but rather on the simplified essentials

of theories and the relationship between economic thought and the social intellectual setting.

Prerequisite: Economics 200 or 302.

Econ. 401 (3-0; 3-0)

Economic Analysis—Micro- and macro-economic analysis; price and distribution theory; aggregate consumption, investment and income determination.

Prerequisite: Economics 301.

Econ. 404. (3-0; 3-0)

Introduction to Mathematical Economics and Econometrics—Simple mathematical models of micro- and macro-economic theory and statistical estimation of such models via cross section and time series analysis. The application of statistical methods, rather than their formal analysis, will be stressed.

Prerequisites: Economics 300 or 301 or 380; a junior course in Calculus; a junior course in Statistics.

Econ. 410. (3-0; 3-0)

Economics of Underdeveloped Countries—A survey of the economic conditions and problems of the under-developed countries of the world; the main economic characteristics of under-developed countries and the requirements of economic growth; measures for the economic development of low-income countries.

Prerequisite: Economics 200 or 302.

Honors and Graduate Courses—

Econ. 500. (3-0; 3-0)

Price and Distribution Theory—An intensive study of the concepts and techniques used in analyzing the pricing of products and factors of production.

Econ. 504. (3-0; 3-0)

Econometrics—A study of the statistical concepts of probability, distributions, moments, and statistical inference as applied to economic problems. Estimation techniques and time series analysis of economic data.

Prerequisites: Economics 300 and 380; Statistics 255 or equivalent; Mathematics 201 or 207.

Econ. 506. (3-0; 3-0)

Mathematical Economics—A survey of mathematical models in economics. An analysis of linear and non-linear programming, game and decision theory, and Leontief systems.

Prerequisites: Economics 300 and 380; Statistics 255 or equivalent; Mathematics 201 or 207.

Econ. 510. (3-0; 3-0)

Economics of Underdeveloped Countries—An analysis of economic policy in under-developed countries; measurement of economic magnitudes; development of resources, roles of government and foreign aid; problems of planning.

Econ. 511. (3-0; 3-0)

Economic Development of Canada—An intensive study of contemporary and historical factors responsible for the economic growth and development of Canada. Some attention will be directed to comparative factors operative in other industrialized countries.

Econ. 520. (3-0; 3-0)

International Economics—An intensive study of the theory of international trade and the balance-of-payments.

Econ. 530. (3-0; 3-0)

Labor Economics—Analysis of the factors influencing the supply and demand for labor services and the process of wage determination; the impact of collective bargaining, legislation and government policy on wage levels, aggregate employment and the structure of employment.

Econ. 550. (3-0; 0-0)

The Public Sector of the Economy—A discussion of the functions, transactions and growth of the public sector in the developed countries; an analysis of the public decision-making and budgeting processes.

Econ. 551. (0-0; 3-0)

Intergovernmental Fiscal Problems—An analysis of the problems of intergovernmental finance with emphasis upon the Canadian experience; special reference will be made to financing education, health, social security and other public services; fiscal problems of metropolitan areas will be considered.

Econ. 560. (3-0; 3-0)

Agriculture in Developing Countries

Econ. 572. (3-0; 3-0)

Industrial Organization—An advanced study of contemporary industrial structure, behavior and performance; an investigation of economic concentration and related Canadian and foreign public policies together with relevant theoretical considerations.

Econ. 580. (3-0; 3-0)

National Income and Economic Growth—An intensive study of the concepts and techniques used in analysing national income relationships and aggregate economic growth.

Econ. 590. (3-0; 3-0)

Comparative Economic Systems—An intensive comparative study of important contemporary systems of economic organization.

Econ. 593. (3s-0; 3s-0)

Seminar in Slavonic and Soviet Studies—An Interdepartmental Seminar.

Econ. 600. (3s-0; 3s-0)

Advanced Micro-Economic Analysis

Econ. 604. (3s-0; 3s-0)

Advanced Econometrics and Mathematical Economics

Econ. 611. (3s-0; 3s-0)
Economic Development

Econ. 621. (3s-0; 3s-0)
International Economics

Econ. 631. (3s-0; 3s-0)
Labor Problems

Econ. 641. (3s-0; 3s-0)
Monetary Theory and Policy

Econ. 651. (3s-0; 3s-0)
Public Finance and Fiscal Policy

Econ. 653. (3s-0; 3s-0)
Transportation and Public Utilities

Econ. 661. (3s-0; 3s-0)
Agricultural Economics

Econ. 663. (3s-0; 3s-0)
Agricultural Marketing

Econ. 671. (3s-0; 3s-0)
Business and Government

Econ. 680. (3s-0; 3s-0)
Advanced Macro-Economic Analysis

Econ. 691. (3s-0; 3s-0)
Comparative Economic Systems

Econ. 692. (3-0; 3-0)
The Soviet Economy

ENGLISH

Professors—H. Kreisel (Head), R. G. Baldwin, A. T. Elder, E. W. Mandel, A. A. Ryan, W. Watson.

Associate Professors—F. Bessai, J. W. Bilsland, D. F. Chapin, J. F. Forrest. D. R. Godfrey, E. G. Griffin, G. S. McCaughey (Academic Secretary), R. D. McMaster, E. J. Rose, I. C. Sowton, Alison G. White.

Assistant Professors—C. Berst, Dianne E. Bessai, E. D. Blodgett, D. C. Butler, F. D. Clandfield, H. A. Hargreaves, G. D. Killam, J. Lauber, Barbara N. de Luna, Jean MacIntyre, R. D. M. Matthews, J. M. Nelson, J. Orrell, N. Parker-Jervis, A. H. Qureshi, G. Samuel, R. Siemens, Juliet Sutton, Sheila Watson, G. J. Zytaruk.

Honors Program

Students wishing to read for Honors in English should consult the head of the department at the beginning of the first year. Students deciding during or at the end of the first year to undertake Honors in English must consult the head of the department at the earliest possible moment in order to ascertain whether their first-year courses and their standing in these courses are acceptable as a basis for admission to Honors at the beginning of the second year; and in cases where the first-year courses do not seem to provide an adequate basis, to discuss what extra work should be taken to rectify the situation.

First Year

English 200, French 200 or Latin 200 or German 200 or Italian 100 or, with permission, another language; an approved philosophy course; two approved options, one of which may be a second language.

Second Year

Three senior English courses; continuation of the first language; an approved option, provided that language requirements have been met*; English 501.

Third Year

Three senior English courses; two approved options, provided that language requirements have been met*; English 502. English 504 will be commenced in the spring of this year and continued throughout the fourth.

Fourth Year

Two senior English courses; two approved options, both of which may be senior English courses if language requirements have been met*; English 504 is to be continued and will count as a fifth course; English 503.

NOTE: Five of the senior English courses must be chosen to represent each of the following periods of literature: Old and Middle English, Renaissance, Seventeenth and Eighteenth Centuries, Nineteenth Century, Modern Period. At the discretion of the department, a student may take up to eleven full senior English courses. All courses are to be chosen in consultation with the head of the department.

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*Language Requirements: A student who begins at University his first language (one chosen to satisfy the language requirement of the first year) must continue it for two more years. If the language of the first year is a language of matriculation, it need be continued for one year only. A student who begins at University a second language (one elected as an approved option) must continue it for one more year, unless specially exempted.

Advice to General Program Students

Students who choose English as a subject of concentration are advised to include in their programs a language other than English.

Junior Courses—

The English department offers two junior courses: English 200 and English 210. The first, English 200, is required of all candidates for the B.A. in the general program, but is open to students in other programs, especially those who wish to make English one of their subjects of concentration or are planning to take senior courses in English. The second, English 210, though accepted as a prerequisite for senior courses, is designed as a terminal course for students who do not expect to take further courses in English.

Engl. 200. (3-0; 3-0)

A Survey of English Literature from Chaucer to the Twentieth Century— A close study of representative masterpieces. Essays and tests on the prescribed literature will be given to afford practice in setting down ideas in good English.

Engl. 210. (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

Senior Courses—

NOTE: English 200 or 210 is a prerequisite for senior English courses.

Engl. 308. (3-0; 3-0)

Old English Language and Literature—An introduction to the language and literature of Anglo-Saxon England.

Engl. 314. (3-0; 3-0)

Middle English Literature—An introduction to some of the characteristic themes and forms of English literature between 1200 and 1500, excluding Chaucer and the Chaucerian tradition.

Engl. 316. (3-0; 3-0)

Chaucer—A study of the major works of Chaucer and of selected poets of the fifteenth century.

Engl. 324. (3-0; 3-0)

Poetry and Prose of the Sixteenth Century—Representative prose and poetry, including selections from the works of More, Spenser, Sidney, Shakespeare, and Donne.

Engl. 332. (3-0; 3-0)

Shakespeare—A study of a selection of Shakespeare's plays. Eighteen plays will be discussed, not all in great detail. Among the eighteen will be the following:—*Love's Labour's Lost; As You Like it; The Tempest; Troilus and Cressida; Richard III; Henry IV, Part One; Henry V; Romeo and Juliet; Julius Caesar; Antony and Cleopatra; Hamlet; King Lear; Macbeth; Othello.*

Engl. 340. (3-0; 3-0)

Milton—A study of Milton's prose and poetry.

Engl. 344. (3-0; 3-0)

Seventeenth Century Poetry and Prose—The literature of the seventeenth century, studied in the light of intellectual developments of the period.

Engl. 348. (3-0; 3-0)

Restoration and Eighteenth Century Literature—Special study of representative works of Dryden, Swift, Pope, Addison, and Johnson, with additional reading in the drama, poetry, and prose of the period.

Engl. 356. (3-0; 3-0)

Poetry and Prose of the Romantic Period—Selections from Crabbe, Cowper, Burns, Blake, Burke, Wordsworth, Coleridge, Scott, Lamb, Hazlitt, De Quincey, Byron, Shelley, Keats.

Engl. 364. (3-0; 3-0)

Poetry of the Victorian Period—Selected works of Tennyson, Browning, Arnold, Clough, Fitzgerald, Rossetti, Morris, Meredith, F. Thompson, and Swinburne.

Engl. 372. (3-0; 3-0)

Currents of Thought in Victorian Prose Literature—Representative works by Burke, Carlyle, J. S. Mill, Newman, Arnold, Ruskin, Huxley, Butler, and Morris.

Engl. 373. (3-0; 3-0)

American Literature to 1900—A selection of representative major writers to 1900. Emphasis is placed upon the writers of the "American Renaissance", especially Poe, Hawthorne, Emerson, Thoreau, Melville, Whitman, Mark Twain, and Henry James.

NOTE: Not to be taken by students with credit in English 394.

Engl. 380. (3-0; 3-0)

Early Twentieth Century — Representative plays by Shaw, Wilde, Galsworthy, Synge, O'Casey, Lawrence, T. S. Eliot, Auden. Representative novels by Bennett, Wills, Conrad, Forster, Lawrence, Joyce, Woolf, Huxley. Poetry, with particular attention to the work of Hopkins, Yeats, Eliot.

Engl. 383. (3-0; 3-0)

American Literature from 1900—A selection of representative major writers from 1900 to the present.

NOTE: Not to be taken by students with credit in English 394.

Engl. 384. (3-0; 3-0)

Canadian Literature—An historical and critical study of the literature of English-speaking Canada.

Engl. 388. (3-0; 3-0)

The History of the English Language—A detailed analysis of the historical development of the English language, together with some study of its cultural and stylistic evolution, as reflected in the prose tradition from the Old English period to the present day. Some knowledge of French and Latin (or German) is recommended.

Engl. 390. (3-0; 3-0)

The Development of English Drama to 1800—A historical and critical study of English drama from its beginnings to the end of the eighteenth century. The works examined will include specimens of mediaeval drama and plays by Marlowe, Jonson, Webster, Dryden, Congreve, Sheridan, and others.

Engl. 392. (3-0; 3-0)

The English Novel—Representative novels by Defoe, Richardson, Fielding, Smollett, Sterne, Goldsmith, Austen, Scott, Dickens, Thackeray, Trollope, Brontë, Eliot, Meredith, Hardy, and Forster.

Engl. 393. (3-0; 3-0)

The History of Literary Criticism—A survey of the major developments in literary criticism from Aristotle to the present time.

Engl. 396. (3-0; 3-0)

Creative Writing—Before registering in this course, students must obtain the consent of the department, preferably at the end of the previous session.

Engl. 399 (3-0; 3-0)

Commonwealth Literature—A historical and critical survey of the literature of the British Commonwealth with emphasis placed upon writers from Africa, the West Indies and the Indian sub-continent.

Honors and Graduate Courses—

Engl. 500.

Conference Course—Special work arranged for senior honors students.

Engl. 501. (1s-0; 1s-0)

Seminar, Second Year Honors English

Engl. 502. (1s-0; 1s-0)

Seminar, Third Year Honors English

Engl. 503. (1s-0; 1s-0)

Seminar, Fourth Year Honors English

Engl. 504.

Honors Tutorial—In the spring of his third year the honors English student, in consultation with the Department, will arrange for a literary project to be pursued under the guidance of a member of the Department for the ensuing summer and winter. The project will involve study of some problem having to do with such matters as technique, genre, criticism or theme. The course will be conducted as a tutorial.

Engl. 552. (3-0; 3-0)

Conference Course—(English 552 offers guidance in special reading courses in any field of English Literature. It is designed to fill in background studies for theses.)

Engl. 560. (1-0; 1-0)

Bibliography and Methods of Research

Engl. 568. (3-0; 3-0)

Literary Criticism—(Principles and History.)

Engl. 576. (2-0; 2-0)

Studies in the English Language—(A synthesis of various approaches to the nature and use of language—historical, synchronic, comparative, philosophical, aestheitc.)

Engl. 584. (3-0; 3-0)

Creative Writing

Engl. 588. (3-0; 3-0)

Studies in American Literature

Engl. 590. (3-0; 3-0)

Canadian and Commonwealth Literature

Engl. 592. (3-0; 3-0)

Old Norse Literature

Engl. 610. (3-0; 3-0)
Old English

Engl. 614. (3-0; 3-0)
Studies in Middle English Literature

Engl. 616. (3-0; 3-0)
Chaucer

Engl. 622. (3-0; 3-0)
The Scottish Chaucerians and English Literature of the Fifteenth Century

Engl. 628. (3-0; 3-0)
Medieval Drama

Engl. 634. (3-0; 3-0)
Studies in Renaissance Poetry

Engl. 640. (3-0; 3-0)
Shakespeare

Engl. 641 (3-0; 3-0)
Studies in Elizabethan and Jacobean Drama

Engl. 646. (3-0; 3-0)
Seventeenth Century Poety and Prose

Engl. 652. (3-0; 3-0)
Milton

Engl. 654. (3-0; 3-0)
Restoration and Eighteenth Century Drama

Engl. 658. (3-0; 3-0)
Studies in Eighteenth Century Literature

Engl. 660. (3-0; 3-0)
Studies in the Eighteenth Century Novel

Engl. 662. (3-0; 3-0)
Studies in the Romantic Novel

Engl. 664. (3-0; 3-0)
Studies in the Romantics

Engl. 670. (3-0; 3-0)
Currents of Thought in English Literature since 1790

Engl. 671. (3-0; 3-0)
Studies in Victorian Poetry

Engl. 672. (3-0; 3-0)
The Victorian Novel

Engl. 676. (3-0; 3-0)
The Modern Novel

Engl. 678 (3-0; 3-0)
Studies in Twentieth Century Prose

Engl. 682. (3-0; 3-0)
Studies in Twentieth Century Poetry

Engl. 684. (3-0; 3-0)
Studies in Modern Drama

Engl. 692. (3-0; 3-0)
Technique of the Novel

FRENCH

See Romance Languages

GENERAL LITERATURE AND CULTURE

Instruction offered by members of the Department of Classics and by the staff of St. Stephen's College.

O.&N.T.L. 351. (3-0; 3-0)

Old and New Testament Literature—A study of the historical background, authorship, sources, literary qualities, and general teaching of the various books and groups of books in the Old Testament. A sketch of Jewish literature subsequent to the Old Testament canon; the Jewish and Hellenistic environment; the occasion, authorship and content of the various books of the New Testament; the growth of the canon; the history of the text.

See also Classics 240, 350 and 351.

GEOGRAPHY

Instruction is offered by members of the Department of Geography leading to a degree in both the Faculty of Arts and the Faculty of Science.

Honors in Geography

The Department offers both the B.A. and B.Sc. degrees with Honors in Geography.

An undergraduate may elect to read for Honors in Geography either at the beginning of the first year or after satisfactory completion of one or two years of the general B.A. or B.Sc. degree course. In any case he must consult the Chairman of the Department before being admitted to the Honors Program. The degree of B.A. or B.Sc. with Honors in Geography is awarded after: 1. Proof of the candidate's ability to read a modern language other than English; 2. Attainment by the candidate of a satisfactory standard in a final comprehensive oral or written examination in the field of Geography at the end of the fourth year.

B.Sc. with Honors in Geography. (Course requirements leading to the degree of B.Sc. with Honors in Geography are given under Geography in the Faculty of Science section of the Calendar.)

B.A. with Honors in Geography

First Year

Geography 201; English 200; two Arts options; Biology 130 or 230.

Second Year

Geography 300; Geography 301; either Geography 302 or 303; two approved options.

Third Year

Geography 400; one of Geography 302, 303, 401, 416, 418 or 420; Zoology 321 and Botany 321; two approved senior options.

Fourth Year

Geography 502; one of Geography 402, 404, 406, 408, 412, 414 or 422; three approved senior options.

Students are required to have a reading knowledge of French or German. At the end of the fourth year a candidate for honors will be required to take an oral or written examination in the field of Geography.

Advice to General Program Students

Students interested in Geography as a subject of concentration may focus on courses leading to a B.A. or B.Sc. degree. In either case, the following sequences are recommended:

Three course sequence: Geography 201, 300 and one other senior Geography course.

Four course sequence: Geography 201, 300 and two other senior Geography courses.

Five course sequence: Geography 201, 300, 301, a regional course and one other senior Geography course.

Students interested in graduate work in Geography should consult the Department.

Note: Descriptions of Geography 201, 301 and other Geography courses considered to be Science courses will be found in the Calendar of the Faculty of Science.

Geog. 200. (3-0; 3-0)

General Geography—An introductory survey course covering various aspects of the field of geography, including physical, human, and regional.

NOTE: Geography 200 is generally considered a terminal course giving general coverage of the field.

Geog. 300. (3-0; 3-0)

Human Geography—The significance of human distribution on the earth. Man's relation to the physical environment; world population problems; cultural patterns in the world; aspects of political and economic geography in selected world trouble areas; racial geography and urban geography. Students planning on taking this course are strongly urged to precede it by Geography 201.

Geog. 302. (3-0; 3-0)

Economic Geography—A study of the distribution of economic activities over the world. Resources, industries, and trade patterns are reviewed systematically and in place.

Geog. 400. (3-0; 3-0)

Anglo-America—The regional geography of Canada and the United States. The physical framework of these countries and its significance in their historical development; the concept of the geographic region, the pattern and characteristics of these regions, with selected detailed studies.

Prerequisite: A previous course in geography, or consent of department.

Geog. 402. (3-0; 3-0)

Northern Lands—Exploration, physical and human characteristics, possibilities of development and settlement of Arctic and sub-Arctic regions. Special emphasis on Alaska, northern Canada, Greenland, and Scandinavia.

Prerequisite: A previous course in geography, or consent of department.

Geog. 404. (2-1s; 3-1s)

Europe—An introduction to the physical and historical geography of Europe, followed by the geographical characteristics of units within the continent. Seminar time will be devoted to selected detailed studies.

Prerequisite: Consent of the department.

Geog. 406. (3-0; 3-0)

Western Canada—A study of the resources, patterns of development and regions of Western Canada. The emphasis will be upon the developed parts of the Prairie Provinces and British Columbia.

Prerequisite: One of Geography 201, 300, 302 or consent of the department.

Geog. 408. (3-0; 3-0)

U.S.S.R.—The regional geography of the Soviet Union.

Prerequisite: Consent of the department.

Geog. 410. (2L-1s; 2L-1s)

Geography in Planning—This course will cover selected historical, theoretical and practical aspects of land use planning in various parts of the world. Physical and cultural aspects of planning projects and problems will be considered; techniques appraised.

Prerequisite: Consent of the department.

Geog. 412. (3-0; 3-0)

Latin America—A survey of the physical features of Middle and South America, followed by consideration of aboriginal peoples, settlement by the Europeans and a regional analysis of the individual countries.

Prerequisite: A course in geography, or consent of the department.

Geog. 414. (3-0; 3-0)

Africa—A general survey of the physical geography of the continent, its colonization and resources, followed by detailed regional studies.

Prerequisite: A course in geography, or consent of the department.

Geog. 416. (3-0; 3-0)

Industrial Geography—A systematic geography focussing attention on manufacturing and raw materials, transport, energy and markets in their areal context and in relation to manufacturing. Emphasis will be placed on geographic analysis of the character of representative manufacturing areas including major manufacturing regions as well as underdeveloped territories.

Prerequisite: Geography 302 or consent of department.

Geog. 420. (3-0; 3-0)

Political Geography—A study of the state area as a geographical phenomenon and as a causal factor in the nature and distribution of other features of geographical significance.

Prerequisite: A course in geography, or consent of the department.

Geog. 422. (2-1s; 2-1s)

Southwest Pacific—The geography of Australia, New Zealand and the islands of Oceania. Where appropriate, special attention will be paid to the geographic implications of the social and economic problems of widely scattered dependent and under-developed territories and of the traditionally agricultural lands.

Prerequisite: A previous course in Geography or consent of department.

Geog. 424. (2-1s; 2-1s)

Resource Conservation—Principles of conservation of renewable resources and their application at the international, national and local levels. Student problems will be assigned.

Prerequisite: A previous course in Geography or consent of department.

Geog. 426. (3-0; 3-0)

Southeast Asia—A survey of the physical geography of an Asiatic subregion; its historico-economic development as well as its present day character as an underdeveloped part of the tropical world; a regional analysis of its individual physical and political units.

Prerequisite: A course in Geography or consent of the Department.

Geog. 456. (3-0; 3-0)

Agricultural Geography—A lecture course designed to give the advanced student an understanding of the development of regional patterns of agricultural production.

Prerequisite: Geography 201 or consent of the Department.

Geog. 500. (1-2s; 1-2s)

History and Nature of Geography—Geography from ancient times to the present; the most important geographers and an assessment of their contributions; significant contemporary geographic concepts; current major developments within special branches of geography; geography in other countries.

Prerequisite: Consent of the department.

Geog. 502.

Reading and Seminar Course

Geog. 504. (3L-1s; 3L-1s)

Mediterranean Lands—A general survey of the geographical characteristics of those lands bordering the Mediterranean Sea will be followed by a series of more detailed studies for comparative purposes.

Prerequisite: Consent of the department.

Geog. 506. (3-1s; 3-1s)

Scandinavia—The regional geography of Norway, Sweden, Denmark, and Finland. Aspects of the historical, economic, and political geography of the area also will be included.

Prerequisite: Consent of the department.

Geog. 508. (1-2s; 1-2s)

Land Use Analysis and Planning— The geographic background to urban and regional developments; analysis of land use patterns and problems in urban and rural areas; use of this analysis in the preparation of urban and regional development plans.

Prerequisite: Geography 410 or consent of department.

Geog. 510. (1-2s; 1-2s)

Historical Geography—The development of historical geography and its relationship to geography and history: case studies of the geography of selected areas at given times in the past utilizing regional and topical approaches.

Prerequisite: A previous course in Geography or consent of department.

Geog. 512. (3s-0; 3s-0)

Advanced Urban Geography—The nature and extent of urbanization; urban form and functions; urban-regional relationships including central place theory. A conceptual approach to these topics will be emphasized but there will also be consideration of the actual nature of urban development in many parts of the world.

Prrequisites: Geography 410 or an undergraduate course in urban geography or consent of the department.

Geog. 525.

Field School in Geography—A survey of the geography of a selected region. Field studies for a week in September preceding registration, followed by the preparation of reports on specified topics. Reconnaissance and micro-studies employing geographical field techniques. Required of candidates for the Master's degree in Geography.

Geog. 542. (3s-0; 3s-0)

Seminar on Latin America

Geog. 544. (3s-0; 3s-0)

Seminar on Africa—A comparative regional study mainly by seminar, of the way in which the African landscapes both physical and cultural, have assumed their present character in the light of evolving world outlook, thought and action since the 15th century. Special reference is made to the geographical ramifications of the problems confronting selected countries of Africa south of the Sahara.

Geog. 548. (3s-0; 3s-0)

The Tropical World—Definition and delimitation of the humid and non-humid tropics, with investigations of the evolution of the physical and cultural landscapes in a tropical environment; an evaluation of the future role of the underdeveloped tropics in the modern world. (Regional differentiation between the American, African and Australasian tropics will be treated by staff specialists.)

Geog. 550.

Research in Regional Geography

Geog. 552.
Research in Human Geography

Geog. 553.
Special problems

Geog. 558. (3s-0; 3s-0)
Transportation Geography—Basic concepts and principles of transportation geography with particular emphasis on the evolution and distribution of transportation facilities; the role of transportation services in economic geography; and their significance in both interregional and intraregional interactions.

Geog. 580. (3s-0; 3s-0)
Seminar on Geography of Settlement

Geog. 630.
Advanced Research in Regional Geography

Geog. 680.
Advanced Research in Human Geography

Geog. 690.
Seminar on Geographic Thought

Geog. 696.
Special Problems

GERMANIC LANGUAGES AND GENERAL LINGUISTICS

Professor—E. Reinhold (Head).
Associate Professors—W. F. Klatte, G. Marahrens, Alison Scott.
Assistant Professors—M. V. Dimié, V. C. Golla, G. D. Prideaux, H. K. Stanford.

GERMAN

Honors in German

A degree with Honors will be awarded in German with an approved second subject such as English, French, History, Latin, Linguistics, Russian, etc.

The program will require seven or eight courses in German, which must include German 510 in the fourth year, four to six in the second subject, and six to eight approved options, for a total of twenty courses. In addition, all Honors students will take in each year such laboratory hours as may be deemed necessary to improve their oral proficiency.

English 200 and a Science course must be included in the first year. History 322 and Linguistics 350 are to be included in the second and third years.

All programs will be arranged in consultation with the other departments concerned and departmental approval of the program is required before registration.

Combined Honors

A degree with Honors in German and English, German and French, German and Latin, German and Russian, may be awarded to students following a pro-

gram of studies similar to the one outlined above, except that the number of senior courses in each subject will be as nearly as possible equal and selected in accordance with departmental requirements.

Advice to General Program Students

The following sequences are recommended to students choosing German as a subject of concentration:

1. For students beginning the language at University: German 100 in the first year; German 200 in the second year; up to three of German 330, 340, 350, 370, 380, 385, 398, 400, in the third year.
2. For students entering with matriculation German: German 200 in the first year: one or two of German 330, 340, 350, 370, 380, 385, 398, 400, in the second year; one or two of German 370, 380, 385, 398, 400, 430. 450, 460 in the third year.
3. German-speaking students and students beginning their studies with more than matriculation German may be admitted to courses numbering 330 and above in their first year, provided they pass a Departmental placement test and obtain the permission of the Dean of Arts. Such students are strongly advised to consult with the Department before registration.

NOTE: German 330, 340, 350 may *not* be taken *after* any of the higher-numbered courses.

Senior, Honors and Graduate courses in German literature will, in general, be conducted in German.

Germ. 100. (3-2; 3-2)

Beginners' German—This course is designed to impart, on the introductory level, an active, practical skill in the use of the spoken and written word. The oral approach will be stressed, using material from everyday-life situations, easy cultural readers, slides, charts, maps etc. The Department's language laboratory will be used for drill purposes and will also be available to students for individual practice.

Germ. 200. (3-1; 3-1)

First Year University German—This course is devoted to the development of the student's ability in speaking, reading and writing German, using modern short stories, cultural readers and audio-visual aids.

Prerequisite: German 30, German 100 or the equivalent.

Germ. 210. (3-0; 3-0)

Scientific German—This is an intensive course for beginners only, aimed at giving students a reading knowledge of scientific German. It is especially designed to meet the needs of honors students from science departments, and of students of the professional faculties who wish to acquire a knowledge of scientific German.

NOTE: This course is not open to general program students.

Germ. 302. (0-1; 0-1)

Practical Oral Study of the German Language—For second year honors students.

Germ. 305. (1-0; 1-0)

Language Tutorial—Practice in composition and oral work, with some emphasis on writing and speaking in German about literary topics.

Co-requisite: one of the following courses: 340, 350, 370, 380, 385, 400.

NOTE: Students are required to take the Tutorial the first time they register in a literature course (German 340, 350, 370, 380, 385, 400). They will not be required to take it again if they register in another of these courses in a subsequent year.

Germ. 310. (3-0; 3-0)

Advanced Scientific German—Reading of advanced scientific and technical texts, supplemented by a systematic and thorough discussion of grammatical difficulties and "trouble makers" in German scientific literature. The use of the dictionary. Analyzing compound words into their component parts. Technical terms. Abbreviations, reading of general texts and articles from major fields of science.

Students who pass German 310 with a grade point of 6.0 or better will be considered by the Department as having fulfilled the reading requirement in German for the Ph.D. at the University of Alberta.

Prerequisite: German 30 or German 100 or German 210 or their equivalent.

Germ. 330. (3-0; 3-0)

German Language and Culture—A study of German phonology, grammar and style. Lectures and assigned reading on German life, literature and civilization.

Prerequisite: German 200 or consent of the department.

Germ. 340. (3-0; 3-0)

Introduction to the Study of German Literature—Basic problems in the theory and practice of literary criticism; selected texts for analysis.

Prerequisite: German 200 or consent of the Department.

See *Note* to German 305, above.

Germ. 350. (3-0; 3-0)

Survey of German Literature—A general survey, a study of selected periods and of major works in German literature.

Prerequisite: German 200 or consent of the department.

See *Note* to German 305, above.

Germ. 370. (3-0; 3-0)

German Enlightenment and Sturm und Drang—The background of the *Aufklärung* and *Sturm und Drang*, with study of representative works.

Prerequisite: German 200 or consent of the Department.

See *Note* to German 305, above.

Germ. 380. (3-0; 3-0)

German Classicism—The ideas and literature of German Classicism; the works of Goethe, Schiller, Novalis, Hölderlin, and Kleist. Special emphasis is placed on the interpretation of the works of Goethe.

Prerequisite: German 200 or consent of the Department.

See *Note* to German 305, above.

Germ. 385. (3-0; 3-0)

German Romanticism—The historical and cultural background and the literature of the German Romantic movement. Texts include works of A. W. Schlegel, Friedrich Schlegel, Wackenroder, Novalis, Tieck, Brentano, Eichendorff and E. T. A. Hoffmann.

Prerequisite: German 200 or consent of the Department.

See *Note* to German 305, above.

Germ. 398. (3-0; 3-0)

Middle High German Language and Literature—A study of the background and structure of Middle High German together with a critical analysis of selected texts in the original.

Prerequisite: One senior German course or consent of the Department.

Germ. 400. (3-0; 3-0)

German Literature of the Nineteenth Century—A study of the leading exponents of nineteenth century drama, fiction, and poetry, including the background of Romanticism, of the Young Germany Movement, of Realism, and of Naturalism.

Prerequisite: German 200 or consent of the Department.

See *Note* to German 305, above.

Germ. 403. (0-1; 0-1)

Practical Oral Study of the German Language—For third year honors students.

Germ. 430. (3-0; 3-0)

German Literature from 1300 to 1700—The history of German literature in the later Middle Ages and early modern times, with analysis of representative works.

Prerequisite: One senior German course, or consent of the Department.

Germ. 450. (3-0; 3-0)

Modern German Literature—The important literary movement since Naturalism (Impressionism, Expressionism, contemporary literature) will be studied, using a number of representative authors of each period. Interpretation of poems, dramas, *Novellen,* and novels.

Prerequisite: One senior German course or consent of the department.

Germ. 460. (3-0; 3-0)

The Development of a Genre in German Literature—A study of the novel, the *Novelle* or the drama, with interpretation of examples from German literature.

Prerequisite: A senior German course.

Honors and Graduate Courses—

Before registering for these courses, students must consult the Department to ensure that they are qualified to undertake the work.

Germ. 500. (3-0; 3-0)

Special Reading Course—Specifically designed for graduate students who wish to prepare themselves for the Ph.D. language requirement in German.

The course consists of an intensive study of essential grammar, reading of graded texts and translation of texts selected from the students' own fields. Conducted on a tutorial basis.

Graduates who obtain a grade point of 6.0 or better will be considered by the Department as having fulfilled the reading requirement in German for the Ph.D. at the University of Alberta.

Not open to undergraduates.

Germ. 504. (0-1; 0-1)
Practical Oral Study of the German Language—For fourth year honors students.

Germ. 510. (2-0; 2-0)
Advanced German Composition—Advanced German composition and conversation; study of difficult problems of grammar, idioms and style.

Required of all students taking honors and majoring in German.

Germ. 540. (3-0; 0-0)
Old High German

Germ. 550. (3-0; 0-0)
Gothic

Germ. 560. (3-0; 0-0)
History of the German Language

Germ. 575. (3-0; 0-0)
Studies in Indo-European

Germ. 580. (0-0; 3-0)
Comparative German Grammar

Germ. 590. (0-0; 0-3)
Old Saxon

Germ. 595. (3-0; 3-0)
Bibliography and Methodology

Germ. 600. (3-0; 3-0)
An Introduction to the Study of Lyric Poetry; Goethe's Poems

Germ. 603.
German Poetry from the Twelfth to the Nineteenth Century

Germ. 606. (3-0; 3-0)
The Development of the German Drama

Germ. 609. (3-0; 3-0)
Development of the German Novelle with Emphasis on the Nineteenth Century

Germ. 610. (3-0; 3-0)
Middle High German Literature

Germ. 612. (3-0; 3-0)
The German Roman from Johann Fischart to Jakob Wassermann

Germ. 615. (3-0; 3-0)
History of German Literature to the Age of Goethe

Germ. 630. (3-0; 3-0)
Lessing and the Period of Enlightenment

Germ. 640. (3-0; 3-0)
Goethe's Faust and the Faust Legend

Germ. 650. (3-0; 3-0)
Schiller's Historical Dramas

Germ. 660. (3-0; 3-0)
Heinrich Heine and the Young Germany Movement

Germ. 670. (3-0; 3-0)
The German Drama of the Nineteenth Century

Germ. 680. (3-0; 3-0)
The Life and Works of Gerhart Hauptmann

Germ. 690. (3-0; 3-0)
Contemporary German Poetry

Germ. 697. (3-0; 3-0)
Special Topics in Germanic Linguistics and Philology

Germ. 698. (3-0; 3-0)
Special Topics in German Literature

Germ. 699.
Conference Course
An honors or graduate course designed to meet the needs of individual students. It may include the detailed study of an author, period, genre, or any literary problem not dealt with in the honors or graduate courses listed above.

SCANDINAVIAN

Scand. 100. (3-2; 3-2)
Elementary Norwegian—Beginners' Norwegian. The oral approach, using language laboratory, is stressed. The course includes reading of literary and cultural material and composition work.

Scand. 300. (3-1; 3-1)
Second Year Norwegian—Reading and study of selected texts in Norwegian literature and culture. Composition and conversation.
Prerequisite: Norwegian 100.

Scand. 350. (3-0; 3-0)
Modern Scandinavian Literature in English—A study of the modern drama (Ibsen, Strindberg) and representative prose works (Hamsun, Undset, Jacobsen, Lagerkvist, Dinesen, Lagerlof).

Scand. 370. (3-0; 3-0)
Introduction to Scandinavian Literature—Reading of representative works (all genres) in the original (Norwegian and Danish).
Prerequisite: Scandinavian 300 or consent of the Department.

Scand. 550. (3-0; 3-0)
Old Icelandic Philology

GENERAL LINGUISTICS

Advice to General Program Students

Students choosing Linguistics as a subject of concentration are recommended to take the following sequences:

Three course sequence: Linguistics 350 and two other courses in Linguistics.

Four course sequence: Linguistics 350, Linguistics 455 and two other courses in Linguistics.

Five course sequence: Linguistics 350, Linguistics 455 and three other courses in Linguistics.

Senior Courses—

Ling. 305. (3-0; 3-0)
Culture and Language—An inquiry into the nature of human communication, its cultural conditions and consequences. Special attention will be given to the interrelations of the linguistics structures and habitual modes of behaviour and thought of various societies.

Note: This course is the same as Anthropology 305.

Ling. 350. (3-0; 3-0)
General Linguistics—An introduction to the study of language in its structural and historical aspects. Examples will be drawn from modern European languages.

Ling. 370. (3-0; 3-0)
Contrastive Linguistics: French and English—An analytical study of the French and English languages, comparing and contrasting their linguistic structure, i.e. phonetics, phonemics, morphology, syntactical patterns and lexicology. Practical work in oral recognition and phonetic transcription.

Prerequisite: French 200 and Linguistics 350 or French 330.

Ling. 372. (3-0; 3-0)
Contrastive Linguistics: German and English—An analytical study of the German and English languages, comparing and contrasting their linguistic structure, i.e. phonetics, phonemics, morphology, syntactical patterns and lexicology. Practical work in oral recognition and phonetic transcription.

Prerequisite: German 200 and Linguistics 350; or German 330.

Ling. 374. (3-0; 3-0)
Contrastive Analysis of Russian and English—A contrastive analysis of the phonological and morphological systems of Contemporary Standard Russian and Modern English. The graphemic systems and syntactical patterns of Russian and English also will be discussed.

Prerequisite or corequisite: Russian 300.

Note: Also listed as Russian 374.

Ling. 387. (3-0; 3-0)

Linguistic Geography—An introduction to the principles of Linguistic Geography. Examples will be drawn largely from varieties of North American English.

Ling. 389. (3-0; 3-0)

Modern English Grammar—A contrastive study of several anlyses of Modern English grammar: traditional, structural and transformational.

Ling. 405. (3-0; 3-0)

Applied Linguistics — The application of structural linguistics to second language learning, and its relationship to various ancillary areas.

Prerequisite: Linguistics 350.

Ling. 455. (3-0; 3-0)

Descriptive Linguistics — Methods of analysing and describing linguistic structure. Problems from a variety of languages, including the indigenous languages of North America.

Prerequisite: Linguistics 350.

Ling. 465. (3-0; 3-0)

Historical Linguistics—A study of linguistic change. Methods of reconstruction of earlier stages of language through the comparison of existing languages and through the examination of written records. Genealogical and typological bases for classifying languages. Particular emphasis will be placed on the Indo-European language family.

Prerequisite: Linguistics 350.

Ling. 470. (3-0; 3-0)

American Indian Linguistics—A survey of indigenous languages of North America, with special reference to those spoken in Western Canada. A study of the distribution and structural characteristics of these languages, supplemented by laboratory work involving analysis of an American Indian language, using a native speaker as informant.

Prerequisite: Linguistics 350.

Ling. 550. (3-0; 3-0)

Advanced Phonetics and Field Methods—Phonetic theory; practical phonetics; recording techniques and methods of analysis illustrated by the study of an American Indian language or Eskimo. Native informants and recorded material will be used.

Prerequisite: Linguistics 455.

Ling. 695. (3-0; 3-0)

Transformational Grammar

Ling. 699.

Conference Course—An honors or graduate course designed to meet the needs of individual students.

GREEK

See Classics

HISTORY

Professors—F. D. Blackley, J. G. Rayback, L. G. Thomas, L. H. Thomas (Chairman).

Associate Professors—M. A. Bax, W. J. Jones, G. A. Rothrock.

Assistant Professors—F. A. deLuna, D. H. Dinwoodie, R. C. Elwood, B. L. Evans, G. Griffiths, W. B. D. Heeney, G. Hermansen, R. Hett, M. Katz, M. La Terreur, H. P. G. Liebel, M. Reckord, U. Trumpener, J. N. Wickenden.

Sessional Lecturers—C. F. Johnston, C. S. MacKinnon, D. Richeson (Exec Assistant).

Honors in History

An undergraduate may elect to read for Honors History either at the beginning of the first year or after satisfactory completion of one or two years of the general B.A. degree course. In any case he must consult the Chairman of the Department before being admitted to the Honors program. The degree of B.A. with Honors in History is awarded after satisfactory completion of an honors essay, proof by the candidate of his ability to read a modern language other than English, and the attainment of a satisfactory standard in the examinations taken in the third and fourth years, including a comprehensive examination.

First Year

History 200, English 200, a language course other than English (usually French or German or Latin or Russian), an approved option, (a course in Economics, Philosophy, Political Science or Psychology is an example), a Mathematics or Science course (Geography 201 is suggested), Physical Education.

Second Year

Second year honors seminar (History 399), two senior (300-level) courses in History, two approved options (Classics, Economics, English, Modern Languages, Philosophy, Political Science or Psychology for example), a further option (which may be a third History course).

Third Year

Third year honors seminar (History 499), two advanced (400-level) courses in History, one of which should be in a field related to the topic proposed for the honors essay of the fourth year; a third course in History, which may be at the 300- or 400-level; two approved options.

Fourth Year

An approved 500-level course in History; History 501 (preparation of the honors essay), a further course in History (which may be at the 300 level); an approved option from another Department. The language examination must also be taken this year, unless the student elects to take it earlier.

Not later than the beginning of the third year, the student should select, in consultation with the Department, a special subject, on some aspect of which he will write his honors essay. Instruction in a special subject or subjects is offered by most members of the Department. A few examples of possible special subjects are: Chaucer's England, Elizabethan England, Seventeenth Century France, Revolutionary France, Southern Africa in the Nine-

teenth Century, the Weimar Republic, the Russian Revolution, the Age of Jackson, the Hudson's Bay Company, Franco-Chinese relations.

The honors essay will be written in the final year under the supervision of a member of the Department, with whom the candidate will confer regularly. The Department may require any candidate for Honors, in addition to submitting his essay, to pass an oral or written examination on the subject of the essay.

Every candidate for Honors in History must satisfy the Department of his ability in sight translation from French, German, or Russian. In particular circumstances, with the approval of the Department, another language related to his studies may be substituted. Language examinations are conducted by the Department twice a year; they may be written by the candidate in his third or fourth year.

In the final year the student is required to write a comprehensive examination in one of the following fields: British Medieval; British Modern; British Empire and Commonwealth; Canadian; American; Medieval European; European, 1500-1789; European 1789 to the present; Russian and East European; East Asian; African.

A student should choose his courses with some attention to the comprehensive examination he wishes to write. *He may not choose for comprehensive examination the field that includes his special subject and honors essay.*

An undergraduate wishing to enter a program of Slavonic and Soviet Studies may register for Honors in History. He should then choose his options in accordance with the pattern prescribed by the Interdepartmental Committee on Slavonic and Soviet Studies. On the satisfactory completion of the whole program, he qualifies to have the notation "Slavonic and Soviet Studies" added to his record.

Advice to General Program Students

Students who select History as a subject of major concentration are advised to take History 200 in their first year. However, students may, except when a pre-requisite is specifically required, take any senior History course (those in the 300 range) in their second or third year without a previous course in History. Students in their third year should choose an advanced course (those in the 400 range) only if they have taken at least two previous courses in History, though exceptions may be made in the case of students with special interest and an adequate background in other related disciplines. Advanced courses are provided for third year students who wish some specialization within areas covered generally by senior courses.

Junior Courses—

Hist. 200. (3-1s; 3-1s)

European History—The history of Europe from the decline of the Roman Empire in the West to the present.

Senior Courses—

Hist. 300. (3-0; 3-0)

Medieval Europe—'

Hist. 304. (3-0; 3-0)
Europe in the age of the Renaissance and Reformation

Hist. 307. (3-0; 3-0)
Europe in the Seventeenth and Eighteenth Centuries

Hist. 309. (3-0; 3-0)
Revolutionary and Nineteenth Century Europe

Hist. 310. (3-0; 3-0)
The Twentieth Century

Hist. 320. (3-0; 3-0)
France—A survey of French history, with emphasis on the period since 1661.

Hist. 322. (3-0; 3-0)
Germany since 1648

Hist. 324. (3-0; 3-0)
Russia—A survey from Kievan times to the present with emphasis on the Imperial period.

Hist. 326. (3-0; 3-0)
The Soviet Union—A survey of Soviet domestic and foreign policy since 1917.

Hist. 340. (3-0; 3-0)
Social and Economic History of Europe

Hist. 350. (3-0; 3-0)
British History—A survey of the history of the British Isles to 1914.

Hist. 351. (3-0; 3-0)
English Constitutional History

Hist. 352. (3-0; 3-0)
The British Empire and Commonwealth

Hist. 353. (3-0; 3-0)
British Medieval History—A survey of the history of the British Isles from Roman times to 1485.

Hist. 354. (3-0; 3-0)
British History 1485-1714—A survey of the history of the British Isles from 1485 to the accession of the Hanoverian dynasty in 1714.

Hist. 355. (3-0; 3-0)
British History since 1714—A survey of British History from the accession of George I to the Second World War.

Hist. 360. (3-0; 3-0)
American History, 1492-1941

Hist. 370. (3-0; 3-0)
Canada—A survey of the political and social history of Canada.

Hist. 380. (3-0; 3-0)
The Far East—A survey of the histories of China and Japan.

Hist. 385. (3-0; 3-0)
Tropical Africa—Early history, alien influence, conquest, and independence.

Advanced Courses—

The following courses, restricted in enrollment, are designed for third-year, honors, and graduate students. Normally they are conducted as seminars and the precise topics covered in any given course may vary from year to year. Some account, therefore, may be taken of the particular interests of students within the framework of the course.

Normally, students who take these courses are expected to have at least two previous courses in History; if they do not, they must obtain the consent of the Department to their registration, and the Department will consider their special needs. For some courses there are additional specified requirements.

Hist. 400. (3-0; 3-0)
Topics in Medieval European History

Hist. 404. (3-0; 3-0)
Renaissance and Reformation

Hist. 418. (3-0; 0-0)or(0-0; 3-0)
Modern France to 1789

Hist. 419. (3-0; 0-0)or(0-0; 3-0)
Modern France since 1789

Hist. 423. (3-0; 0-0)or(0-0; 3-0)
Central Europe since 1800

Hist. 424. (3-0; 0-0)or(0-0; 3-0)
Topics in Soviet History

Hist. 427. (3-0; 3-0)
Topics in Russian History from Kievan times to the present

Hist. 428. (3-0; 0-0)or(0-0; 3-0)
Eastern Europe since 1800

Hist. 430. (3-0; 3-0)
The Intellectual History of Europe since 1300

Hist. 451. (3-0; 3-0)
Topics in English Medieval History

Hist. 452. (3-0; 3-0)
Topics in Tudor and Stuart History

Hist. 454. (3-0; 3-0)
English Society in the Nineteenth Century

Hist. 465. (3-0; 3-0)
American History since 1876

Hist. 466. (3-0; 3-0)
American History to 1876

Hist. 469. (3-0; 3-0)
American Foreign Policy

Hist. 470. (0-0; 3-0)or(3-0; 0-0)
The Canadian West to 1870

Hist. 471. (3-0; 0-0)or(0-0; 3-0)
The Canadian West since 1870

Hist. 472. (0-0; 3-0)or(3-0; 0-0)
Canada to 1791

Hist. 473. (3-0; 0-0)or(0-0; 3-0)
Canada, 1791-1867

Hist. 474. (3-0; 0-0)or(0-0; 3-0)
Canada, 1867-1914

Hist. 475. (3-0; 0-0)or(0-0; 3-0)
Canada since 1914

Hist. 476. (3-0; 3-0)
French Canada Since 1867

Hist. 477. (3-0; 3-0)
Topics in Canadian History

Hist. 480. (3-0; 3-0)
Topics in East Asian History

Hist. 485. (3-0; 3-0)
Africa

Hist. 486. (3-0; 3-0)
British Empire and Commonwealth

Hist. 490. (3-0; 3-0)
Latin America

Hist. 492. (3-0; 3-0)
The Middle East

Honors and Graduate Courses—

Hist. 399. (1s-0; 1s-0)
Seminar, Second-Year Honors History

Hist. 499. (1s-0; 1s-0)
Seminar, Third-Year Honors History

Hist. 501. (3-0; 3-0)
Special Subject—Fourth Year, Honors History
Preparation of the Honors essay, as required in the fourth year of the Honors program.

Hist. 511. (3-0; 3-0)
British Medieval History (Comprehensive)

Hist. 512. (3-0; 3-0)
British Modern History (Comprehensive)

Hist. 513. (3-0; 3-0)
Canadian History (Comprehensive)

Hist. 514. (3-0; 3-0)
American History (Comprehensive)

Hist. 515. (3-0; 3-0)
Medieval European History (Comprehensive)

Hist. 516. (3-0; 3-0)
European History, 1500-1789 (Comprehensive)

Hist. 517. (3-0; 3-0)
European History since 1789 (Comprehensive)

Hist. 518. (3-0; 3-0)
Russian and East European History (Comprehensive)

Hist. 519. (3-0; 3-0)
British Empire and Commonwealth History (Comprehensive)

Hist. 520. (3-0; 3-0)
East Asian History (Comprehensive)

Hist. 521. (3-0; 3-0)
African History (Comprehensive)

Hist. 593. (3-0; 3-0)
Slavonic and Soviet Studies: an interdepartmental seminar

Hist. 600.
Conference Course—Directed studies in special subjects to meet individual requirements.

Hist. 602. (3-0; 3-0)
Philosophy of History and Historical Methodology—This course, or its equivalent, is required of all candidates for higher degrees in History.

Hist. 605. (3-0; 0-0) and/or (0-0; 3-0)
Research Seminar—The specific area of research is announced by the Department in the term before the seminar is offered.

Hist. 621. (3-0; 3-0)
Medieval Europe

Hist. 623. (3-0; 3-0)
Early Modern Europe

Hist. 625. (3-0; 3-0)
Modern Europe

Hist. 652. (3-0; 3-0)
Medieval England

Hist. 654. (3-0; 3-0)
Tudor and Stuart England

Hist. 656. (3-0; 3-0)
Modern Britain

Hist. 658. (3-0; 3-0)
British Empire and Commonwealth

Hist. 660. (3-0; 3-0)
American History since 1607

Hist. 670. (3-0; 3-0)
Canada

Hist. 680. (3-0; 3-0)
East Asia

Hist. 685. (3-0; 3-0)
Africa

HOUSEHOLD ECONOMICS

Instruction offered by members of the School of Household Economics.

H.Ec. 350. (3-3; 3-3)
Applied Art—The principles and elements of design; selection and arrangement of materials and objects in the home; analysis of house plans. Historic styles of architecture and furniture and their relationship to contemporary design.

INTERDISCIPLINARY STUDIES

Int. St. 500 (3-0; 3-0)
Nature of Man—To confront simulaneously the various conceptions of the nature of man held by sociologists, psychologists, biologists, philosophers, theologians, writers and artists, and to explore a selection of the major social and philosophical issues which confront man today from the perspectives of these disciplines.

ITALIAN

See Romance Languages

LATIN

See Classics

LINGUISTICS

See Germanic Languages and General Linguistics

MATHEMATICS

Either the B.A. or B.Sc. degree may be taken with Mathematics as the principal subject of concentration. Students wishing the B.A. degree should consult the Department of Mathematics concerning a suitable sequence of courses.

B.A. Honors in Mathematics

First Year

Mathematics 206 and 271; English 200; one Arts option; one option; Physical Education.

Second Year

Mathematics 306 and 360; two Arts options; one option.

Third Year

Mathematics 424; Mathematics 309 or 421, or Statistics 455 or Computing Science 310 or 460; two senior Arts options; one senior option.

Fourth Year

Mathematics 410 or 423 or 426 or 505 or 580; Mathematics 502; Two Arts options; Option.

NOTE: (1) The program must be approved by the Department of Mathematics.

(2) The Department offers both the B.A. and the B.Sc. degrees with honors in Mathematics.

(3) A list of mathematics courses, together with their descriptions, appears in the Faculty of Science calendar.

(4) The usual first year calculus course for a general course student in Arts is Mathematics 201 or 207. However, a general course student may take Mathematics 206 provided he has the permission of the Department. If a student passes Mathematics 206 he may apply to the Department for admission to second year Honors. A student with a good record in Mathematics 201 or 207 may also apply to the Department for admission on the understanding that his record will be considered equivalent to Mathematics 206. If such a student is granted admission he must satisfy all the requirements of the honors program he has chosen.

MUSIC

Professor—R S Eaton (Head).

Associate Professors—V. B. Archer, A. B. Crighton, T. Rolston, M. Sasonkin, R. Stangeland.

Assistant Professors—C. Kenneson, E. Lincoln, A. M. Munn.

Advice to General Program Students

The following sequences of courses are recommended to students choosing Music as a subject of concentration:

1. Music 200, 300, 400 or Music 250, 350 and 352 (together), 450 and 452 (together) in a three course sequence.
2. Music 200, 250 and two of 300, 350 and 352 (together), 400, in a four course sequence.
3. Music 200, 250, 300 and two of 350 and 352 (together), 400, 410, 450 and 452 (together) in a five course sequence.

Music 100. (3-0; 3-0)

An Introduction to Concert Music—An elementary course in the history and appreciation of concert music. Composers, styles and musical forms of the standard repertory will be studied. Attendance at prescribed concerts and rehearsals will be arranged.

No prerequisite.

Music 100 will *not* be accepted as a prerequisite for Music 200.

Music 200. (2-3; 2-3)

History of Music and Choral Technique—Elementary theory and practice of singing, choral technique and interpretation, sight singing and ear training. History of music. Introduction to form. Instruments of the orchestra. Assignments include one hour weekly of prescribed listening; records and scores are provided and the listening room is reserved at various times for small groups. Weekly reading will be assigned, part of it related to the listening.

Theory: The student will be required in March (of the session in which the course is taken), to pass an elementary examination in notation with 80% standing.

Prerequisite: (a) Western Board of Music Grade III theory or equivalent, *and* (b) Western Board of Music Grade V practical or equivalent.

Music 203. (2-6; 2-6)

History of Music, Choral and Instrumental Techniques—Required of students in the first year of the Bachelor of Music program* and open only to those students. The same content as Music 200 with the addition of a laboratory in the principles and practice of woodwind instruments.

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*(Theory and Composition or Church Music)

Music 210. (2-3; 2-3)

Foundations of Music—The development of a musical repertory and knowledge of basic content appropriate for teachers. (Open to B.Ed. students lacking the prerequisite for Music 200; not to be used as a prerequisite in place of Music 200 for advanced courses in Music.)

Music 215. (1-0; 1-0)

Second Practical Subject—Required in the first year of the B.Mus. program.

Music 225. (2-0; 2-0)

First Practical Subject—Required in the first year of the B.Mus. program.

Music 233. (3-0; 3-0)

Hymnology—History of the hymn and hymn tune; types of hymns and their uses; analysis and interpretation of hymns; evaluation of standard hymnals.

Music 250. (2-3; 2-3)

Elementary Harmony—Diatonic harmony, including secondary sevenths. Modulation. Use of unessential notes of all kinds. Harmonizing of chorales in the style of Bach. Form; Ear Training; Sight Singing, Keyboard Harmony.

Music 260. (0-1; 0-1)

Theory Laboratory—Investigation of traditional compositional styles and techniques. Required of all B.Mus. Theory major students and is a co-requisite of Music 250.

Music 300. **(2-6; 2-6)**

History of Music and Instrumental Technique—A study of the history of Music from the year 1600 to 1900. Scores and records of music are provided. A critical evaluation of the styles of various composers is emphasized. The laboratory consists of the study of brass and woodwind intruments as applied to band and orchestral groups.

Prerequisite: Music 200 or equivalent.

Music 301. (2-3; 2-3)

History of Music—A study of the history of music from the year 1600 to 1900. Scores and records are provided. A critical evaluation of the styles of various composers is emphasized. The Laboratory consists of two hours weekly of Listening. Required of students in the second year of the Bachelor of Music program in Applied Music and open only to those students.

Prerequisite: Music 200 or equivalent.

Music 303. (2-6; 2-6)

History of Music and Instrumental Technique—Required of students in the second year of the Bachelor of Music program* and open only to those students. The same content as Music 300 except that the instrumental laboratory is limited to stringed instruments.

Prerequisite: Music 203.

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*(Theory and Composition or Church Music)

Music 311. (2-3; 2-3)

Band and Orchestra—Practical instruction in band instruments and in all matters relating to the formation, direction, and administration of the beginning band. This is an intensive course intended only for persons already competent in theoretical and practical music.

Instrumental studies will include tone production, fingering, and the embouchure of all brass and woodwind instruments. A survey of percussion instruments and their performance techniques. Care of band instruments. Conducting. A special study of clarinet, trumpet, trombone and rudimentary drumming.

Music 315. (1-0; 1-0)

Second Practical Subject—Required in the second year of the B.Mus. program.

Music 325. (2-0; 2-0)

First Practical Subject—Required in the second year of the B.Mus. program.

Music 333. (3-0; 3-0)

Music of the Great Liturgies—Comparison of the Jewish, Eastern Orthodox, Catholic, Lutheran and Protestant Episcopal liturgies and their music; relation to music in the non-liturgical service; the church year.

Music 350. (2-3; 2-3)

Harmony—Chromatic harmony in four parts. Ear Training, Sight Singing and Keyboard Harmony, Harmonic Analysis.

Prerequisite: Music 250.

Music 352. (2-0; 2-0)

Counterpoint—Free counterpoint in two and three parts. Elementary canonic writing. Setting of simple texts. The writing of two-part inventions.

Music 353. (2-4; 2-4)

Harmony and Orchestration—Open only to students in the second year of the Bachelor of Music program. The same content as Music 350 with the addition of a laboratory in orchestration.

Prerequisite: Music 250.

Music 360. (0-1; 0-1)

Theory Laboratory—Required of all B.Mus. Theory major students. A sequent course to Music 260 and a co-requisite of Music 353, with emphasis on the study of, and writing in, untraditional styles of the 20th Century.

Music 400. (2-5; 2-5)

History of Music and Instrumental Technique—Styles and techniques of composers from Debussy to the present.

The laboratory includes the study of stringed instruments as applied to orchestral groups.

Prerequisite: Music 300 or equivalent.

Music 401. (2-2; 2-2)

History of Music—Styles and techniques of composers from Debussy to the present. The Laboratory consists of two hours weekly of Listening. Required of students in the second year of the Bachelor of Music program in Applied Music and open only to those students.

Prerequisite: Music 301 or equivalent.

Music 403. (2-5; 2-5)

History of Music and Instrumental Technique—Open only to students in the third year of the Bachelor of Music program. The same content as Music 400 except that the instrumental laboratory is limited to brass instruments.

Prerequisite: Music 303 or equivalent.

Music 410. (3-0; 3-0)

Music of the Baroque—Study of styles, forms and literature of the Baroque Era (1600-1750).

Music 412. (2-2; 2-2)

Medieval and Renaissance: Collegium Musicum—Music of the early Christian church. The mass, plainsong, the development of notation. The Troubador movement. The development of polyphony through organum, clausula and motet. A study of composers' styles and techniques from Machaut to Palestrina.

Laboratory: Listening and a weekly one-hour class in performance practices.

Required in the fourth year of the B.Mus. program by candidates in Church Music.

Music 415. (1-0; 1-0)

Second Practical Subject—Required in the third year of the B.Mus. program.

Music 425. (2-0; 2-0)

First Practical Subject—Required in the third year of the B.Mus program by candidates in Theory and Composition and Church Music.

Music 426. (2-1; 2-1)

First Practical Subject—Ensemble laboratory. Required in the third year of the B.Mus. program by candidates in Applied Music.

Music 433. (3-0; 3-0)

Music in the Western Church—The nature of worship; music as an aid to worship; kinds of service music; orders of worship; congregational participation; responsibilities of director, organist, and choir; evaluating service music.

Music 450. (2-3; 2-3)

Harmony—Introduction to five-part harmony. Advanced chromatic harmony.

Writing for various instruments; the setting of words. Keyboard harmony; score reading; analytical techniques; knowledge of standard musical works.
Prerequisite: Music 350.

Music 452. (2-0; 2-0)

Counterpoint—Continuation of three-voiced counterpoint, vocal and instrumental styles. Introduction to four-voiced counterpoint. Ground bass, Round, Invertible Counterpoint at 8^{ve} and 15th. Canons at any interval. Elements of Fugue. The Three-Part Invention.

Music 453. (2-4; 2-4)

Harmony and Orchestration—Open only to students in the third year of the Bachelor of Music program. The same content as Music 450 with the addition of a laboratory in orchestration.
Prerequisite: Music 353.

Music 460. (1-0; 1-0)

Composition—Required of all B.Mus. Theory major students. A sequent course to Music 360 and a co-requisite to Music 453, with emphasis on the study of, and writing in, larger forms.

Music 500. (3s-0; 3s-0)

Music Literature Seminar—The analysis and preparation of musical materials for presentation to music literature classes. Open to holders of the B.Ed. degree with a major in music.

Music 510. (2-0; 2-0)

Notation of Medieval Music — A study of the development of notation through the various schools of neume notation, Gregorian notation, Troubadour, early polyphonic, modal notation, the Franconian system and the period of Ars Nova. The transcription of facsimiles.

Music 515. (1-0; 1-0)

Second Practical Subject—Required in the fourth year of the B.Mus. program in Applied Music.

Music 520. (2-0: 2-0)

Notation of Renaissance Music—A sequent course to Music 510. Tablature and keyboard notation, proportional notation, white notation of the 15th and 16th centuries. The transcription of facsimiles.

Music 526. (2-1; 2-1)

First Practical Subject: Ensemble Laboratory—Required in the fourth year of the B.Mus. program by candidates in Applied Music.

Music 527. (2-1; 2-1)

Literature and Pedagogy—Required in the fourth year of the B.Mus. program by piano candidates in Applied Music.

Music 528. (2-0; 2-0)

Choral and Organ Literature—Required in the fourth year of the B.Mus. program by candidates in Church Music.

Music 552. (2-0; 2-0)

Counterpoint—Sixteenth Century Counterpoint. The writing of motets and madrigals up to four parts. Some four-part setting of texts in 18th and 19th century styles.

Music 553. (2-0; 2-0)

Advanced Harmony and Fugue—Analytical study of important works of the Romantic period including Richard Strauss. Four and Five-part Harmony. Analytical study of Fugues from pre-Bach up to and including the 20th century. Creative wrtiting including use of all contrapuntal devices. The writing of an entire fugue.

Music 554. (2-0; 2-0)

Score Reading and Orchestral Literature—Approaches to Score Reading at and away from the keyboard. The Classical String Quartet and Orchestra. A detailed study of Orchestral Literature from Haydn to the present day.

Music 555. (2-0; 2-0)

Conducting—Conducting of choirs and instrumental groups. Similarities and difference in conducting choral and instrumental groups of varying sizes and accomplishments.

Music 560. (1-0; 1-0)

Composition—Required of all B.Mus. Theory major and Composition major, students. A sequent course to Music 460 and a co-requisite to Music 553, with emphasis on the study of, and writing for, larger groups of voices and instruments.

Music 570. (2-0; 2-0)

Aural Theory—

(1) Sight Singing in Treble, Bass and C clefs including chromaticism, advance modulation, rhythmic and intervallic problems. Materials from 20th century vocal and choral literature are included.

(2) Harmonic dictation up to 4 parts including all traditional chromatic triads and 7ths and both elementary and advanced modulation. Contrapuntal dictation in 2 voices in contemporary style.

(3) Special exercises in listening (i) detection of errors: i.e. melodic, chordal, rhythmic in key-board music of relative difficulty.

Music 571. (2-0; 2-0)

Choral and Band Arranging—

Choral—Scoring for two, three and four parts music which would be useful for groups of various levels of achievement. Adaptation and/or Reduction from standard major works i.e. oratorios and cantatas for any of these groups. The use of suitable piano accompaniments if required.

Band—For the small groups (chamber groups) Brass choir, full band: Arrangements made from standard keyboard literature from the 16th

century to the present day, ranging in difficulty from elementary to advanced. Transcription of excerpts from orchestral literature of moderate difficulty for full band.

PHILOSOPHY

Professor—A. M. Mardiros (Head).
Associate Professors—M. Cohen, G. Price, H. Tennessen.
Assistant Professors—R. Bosley, W. Eastman, D. C. Hicks, M. H. Kelley, E. W. Kemp, J. M. Michelsen, K. I. Mills, D. M. Murray, R. A. Shiner, F. F. Van De Pitte, M. M. Van De Pitte, C. T. J. Williamson, M. Wright.
Staff at Affiliated College—Rev. J. Daley, Rev. J. W. Dore.

Honors Programs

Degrees with Honors from this Department will fall into these groups:
(1) B.A. with Honors in Philosophy and an approved minor subject;
(2) B.A. with Honors in Philosophy and Greek.

Students are advised to consult the Department for information before choosing one of the groups, and in any case, Departmental approval of the final program of studies is required before registration. In the case of students under (2), the program will be arranged in consultation with the Department of Classics and the Department of Philosophy.

Honors in Philosophy will require nine courses in Philosophy. Four in a minor subject, or an integrated selection of five or six courses in a group of subjects, will also be required. This part of the program will be closely related to the student's special interests within the field of philosophy. Optional courses outside the fields of philosophy and the minor will complete the program.

Honors in Philosophy and Greek will follow the requirements of Honors in Philosophy, with some reduction in the number of Philosophy courses in order to increase the number of Greek courses beyond the requirements for a minor subject.

Advice to General Program Students

The Department of Philosophy places no restrictions upon the choice of philosophy courses other than those imposed by prerequisite requirements and Faculty regulations.

Junior Courses—

Phil. 240. (3-0; 3-0)

Introduction to Western Philosophy—This course is designed to introduce the student to the main problems and theories that have dominated philosophical thought in the Western world, through the study and discussion of selected philosophical classics. Emphasis will be placed both upon a sound acquaintance with the main outlines of our philosophical tradition and upon the ability to handle philosophical ideas independently. To this end both lectures and discussions will form part of the student's training.

Phil. 242. (3-0; 3-0)

Foundations and Development of Christian Philosophy—A study of the ideas and main currents of Western Philosophy from its beginnings in the creative period of Greek thought, to achieve an appreciation of the historical roots of

our civilization. Selected ideas and problems will be examined in the writing of significant contributors to this development. Lectures and discussion.

(NOTE: This course is offered by St. Joseph's College and is accepted as an alternative to Phil. 240)

Phil. 250. (3-0; 3-0)

Introduction to Logic—This course introduces the student to the techniques of both formal and informal logic, and of scientific method; the detection of fallacies in arguments; the notion of validity in deductive arguments, with a discussion of both traditional syllogistic logic and modern symbolic logic; key notions in the logic of science, such as the role of hypothesis formation and experimentation; the nature of scientific explanation and the distinction between inductive and deductive reasoning. The general purpose of the course is to show how to appraise arguments logically.

Senior Courses—

Phil. 310. (3-0; 3-0)

Philosophy of Civilization—This course aims at the examination and definition of the concept of civilization. The purpose of such an attempt is twofold: to satisfy the need to comprehend human culture as a whole and to provide a conceptual framework within which national, regional and ideological differences can be discussed rationally.

Phil. 320. (3-0; 3-0)

Introduction to Indian and Chinese Philosophy—The first term will be devoted to Indian philosophy, the second term to Chinese philosophy. In dealing with Indian thought considerable attention will be paid to Indian religious thinking; in dealing with Chinese thought particular attention will be given to ethical thinking.

Prerequisite: Philosophy 240.

Phil. 340. (3-0; 3-0)

Greek Philosophy

Prerequisite: Philosophy 240.

Phil. 342. (3-0; 3-0)

Philosophy from Descartes to Kant

Prerequisite: Phil. 240.

Phil. 346. (3-0; 3-0)

Medieval Philosophy—An introduction to the philosophy of the Middle Ages. Stress will be laid on the reading of texts, especially those of St. Augustine, St. Bonaventure, St. Thomas Aquinas, Duns Scotus and William of Ockham. Arabian and Jewish philosophy will also be considered as essential to the picture of philosophical thought.

Prerequisite: Philosophy 240 or 242 or 246.

Phil. 350. (3-0; 3-0)

Aesthetics—An inquiry into the nature and justification of standards of art and beauty.

Phil. 352. (3-0; 3-0)

Social Philosophy—A philosophical and synoptic study of the nature of society.

Phil. 354. (3-0; 3-0)

Ethics—An inquiry into the nature and justification of moral standards.

Phil. 358. (3-0; 3-0)

Philosophy of Religion—A philosophical examination of the fundamental concepts of religious thinking.

Prerequisite: A previous course in philosophy, or consent of department.

Phil. 360. (3-0; 3-0)

Symbolic Logic—An introduction to the logic of both natural and artificial languages emphasizing logical features such as inference, deduction, substitution and satisfiability. A symbolic deductive system governed only by explicit rules will be constructed and the properties of such a system will be examined.

Phil. 362. (3-0; 3-0)

Empirical Semantics—This course undertakes empirical investigations into the meaning and use of key-words, locutions, and sentences, the clarification of which may be considered of philosophical and scientific importance.

Prerequisite: Consent of instructor.

Phil. 440. (3-0; 3-0)

Language and Logic—An introduction to problems concerning the nature of language, and the relation between language and reality. Theories of Description and Meaning will be discussed, and the student will be introduced, in an elementary way, to the analysis of some of the fundamental concepts of the philosophy of logic and mathematics: *truth, proposition, necessity, number,* the *analytic/synthetic* distinction, etc. The philosophers discussed will include Frege, Russell and the early Wittgenstein.

Prerequisite: Philosophy 240 and consent of the Department.

Phil. 442. (3-0; 3-0)

Nineteenth Century Philosophy—This course offers an examination of some of the main philosophical movements in the Nineteenth Century; the post-Hegelian reaction against metaphysical idealism in Germany, British idealism and American pragmatism. Among philosophers to be discussed are Schopenhauer, Nietzsche, Bradley and Peirce.

Prerequisite: Philosophy 342.

Phil. 444. (3-0; 3-0)

Modern Analytical Philosophy—A discussion of some of the more important analytical writings with special reference to topics in the Philosophy of Mind and the Philosophy of Language and to the work of Wittgenstein, Ryle and Austin.

Prerequisite: Philosophy 342 or consent of the Department.

Phil. 454. (3-0; 3-0)

Advanced Ethics—This course offers an examination of some central works in the history of moral philosophy plus selections from contemporary writers,

with a view to establishing the nature of morality and the role of moral philosophy. Basic problems to be discussed are: the nature of moral principles, judgements, reasons, obligations and rights. The philosophers discussed will include Aristotle, Kant, Hume, Bradley, Moore and Prichard.

Prerequisite: Philosophy 354 or consent of the Department.

Phil. 462. (3-0; 3-0)

Philosophy of Science—An enquiry into the methods and techniques of science.

Prerequisite: Consent of department.

Phil. 464. (3-0; 3-0)

Existentialism—This course examines the Existentialist approach, concentrates on more technical contributions to epistomology, ontology and ethics made by such representatives as Kierkegaard, Heidegger, Jaspers and Sartre, and compares their approaches with German Idealism, German and French Phenomenology as well as with varieties of modern analytically oriented philosophy.

Prerequisite: Philosophy 240 or consent of department.

Honors and Graduate Courses—

Candidates for honors will arrange their program in consultation with the head of the department.

Phil. 502. (3-0; 3-0)
Plato

Phil. 504. (3-0; 3-0)
Aristotle

Phil. 506. (3-0; 3-0)
St. Thomas Aquinas

Phil. 510. (3-0; 3-0)
Hegel

Phil. 512. (3-0; 3-0)
Marx and Marxism

Phil. 514. (3-0; 3-0)
Kierkegaard

Phil. 516. (3-0; 3-0)
Wittgenstein

Phil. 522. (3-0; 3-0)
Moral Philosophy

Phil. 524. (3-0; 3-0)
Political and Social Philosophy

Phil. 526. (3-0; 3-0)
Philosophy of Art

Phil. 528. (3-0; 3-0)
Philosophy of History

Phil. 536. (3-0; 3-0)
Contemporary Phenomenology

Phil. 548. (3-0; 3-0)
Conference Course

Phil. 554. (3-0; 3-0)
Theory of Value

Phil. 556. (3-0; 3-0)
The Philosophy of Kant

Phil. 558. (3-0; 3-0)
The Philosophy of Religion

Phil. 560. (3-0; 3-0)
Logic

Phil. 566. (3-0; 3-0)
Theory of Knowledge

Phil. 568. (3-0; 3-0)
Philosophy of Mind

Phil. 570. (3-0; 3-0)
Philosophy of Language

Phil. 574. (2s-0; 2s-0)

Seminar in Philosophy and Psychology—A study of the fundamental methodological, conceptual, and philosophical issues in psychology.

PHYSICAL EDUCATION

Instruction offered by members of the Faculty of Physical Education.

Phys. Ed. 218. (0-2; 0-2)

Recreational Activities—Emphasis on the fundamentals of the following recreational activities: touch football, Bordenball, volleyball, badminton, basketball, tumbling, aquatics, circuit training and golf.

Course required of all first-year men.

Phys. Ed. 228. (0-2; 0-2)

Recreational Activities—Emphasis on the fundamentals of the following recreational activities: tennis, aquatics, badminton, volleyball, basketball, social dancing and golf.

Course required of all first-year women.

POLISH

See Slavonic Languages and Literature

POLITICAL SCIENCE

Professors—C. Bay, (Head), G. R. Davy, F. C. Engelmann, L. C. Green, K. Gordon.

Associate Professors—R. Baird, B. R. Bociurkiw, W. F. Dawson, S. M. M. Qureshi.

Assistant Professors—R. R. Gilsdorf, F. G. Hulmes, N. O. Linton, R. A. Melvin, T. C. Pocklington.

Honors in Political Science

First Year

Political Science 200.
English 200.
A laboratory science.
Two options to be chosen in consultation with the department.
Physical Education.

Second Year

Two courses in Political Science.
Three options to be chosen in consultation with the department.

Third and Fourth Years

Before entering the third year, each student will arrange, in consultation with the department, a program of study and lectures to prepare himself for final comprehensive examinations. Unless they have been taken in the First and Second Years, two courses in foreign languages, preferably French or German or Russian, are required. Students may take either two courses in one language or one in each of two languages.

Students wishing to undertake a program of Slavonic and Soviet studies may register for Honors in Political Science. By choosing his options according to the course requirements set out by an interdepartmental committee, a student may qualify to have the notation "Slavonic and Soviet Studies" added to his record upon satisfactory completion of his whole program.

Advice to General Program Students

Students interested in Political Science as a subject of concentration should take one of the following sequences:

Three course sequence: Political Science 200 and two senior Political Science courses;

Four course sequence: Political Science 200 and three senior Political Science courses;

Five course sequence: Political Science 200, Political Science 310 and three other senior Political Science courses.

Students who elect a five course sequence as a preparation for graduate studies in Political Science should consult the Department.

Junior Course—

Pol S 200. (3-0; 3-0)

Elements of Political Science—A study of the principles and practices of modern government, with emphasis on the democratic constitutional state. Among the topics studied are the nature and theory of the state; types of constitutions; the functions and composition of the legislature, executive and judiciary; representation; political parties and pressure groups.

Senior Courses—

Pol S 310. (3-0; 3-0)

History of Political Thought—A historical and critical survey of the development of political and social philosophy from Ancient Greece to the present time, with selected readings from major political writers.

Pol S 320. (3-0; 3-0)

Government of Canada—A study of the structure and functioning of the government of Canada, especially of the Commons, the Senate, the Cabinet System, the Civil Service; and the role of political parties.

Pol S 322. (3-0; 3-0)

Local Government and Politics—A study of urban and rural governments, of general and special purpose, and of their relationships with the provincial and national governments. The study will be of formal institutions (legislative, executive, administrative, and judicial) and of informal institutions such as parties and pressure groups.

Pol S 331. (3-0; 3-0)

Government of the United States—A study of the history and background of American political institutions. Emphasis will be placed on the development, significance and philosophy of the Constitution, and on parties, pressure groups and the working of congressional government.

Pol S 340. (3-0; 3-0)

Soviet Government and Politics—An analysis of theory and practice of the Soviet state, with special attention to Bolshevik political theory, the Communist party, political institutions, federalism and the policy-making processes in the U.S.S.R.

Pol S 360. (3-0; 3-0)

International Politics—A study from the viewpoint of political science of the elements and general nature of the relations between modern states. The framework and functioning of international institutions—law, diplomacy and organization— is studied and attention is paid to the political and other forces at work, including the role of power and the efforts to achieve international peace.

Pol S 370. (3-0; 3-0)

Politics of Emergent Nations — A study of the institutions and politics of selected nations in Asia, Africa and Latin America.

Pol S 371. (3-0; 3-0)

Governments of the United Kingdom and Commonwealth—A study of the structure and functioning of the government of the United Kingdom, and the adaptation of the Cabinet System in selected countries within the Commonwealth.

Pol S 373. (3-0; 3-0)

Government of the United Kingdom—A study of the structure and functioning of the government of the United Kingdom, especially the monarchy, the cabinet system, parliament, the civil service and parties.

Pol S 383. (3s-0; 3s-0)

Governments of Western European Democracies—A study of the structure and functioning of the governments of selected Western European Democracies.

Pol S 391. (3-0; 3-0)

Parties and Pressure Groups—A study of the role of political parties and pressure groups in the governmental process.

Pol S 393. (3-0; 3-0)

Political Sociology—A study of the social basis of political institutions and practices, and of the impact of these institutions and practices on society.

Prerequisite: Political Science 200 or Sociology 202.

Pol S 395. (3-0; 3-0)

Political Behaviour—The study of individual and mass political behaviour from the sociological and psychological viewpoint.

Pol S 451.

Theory of Public Administration—A study of the place and significance of administration in government, administrative organization and management, governmental and public control of administration, with special references to Canada, the United Kingdom and the United States.

Prerequisite: Political Science 320 or 331 or 371.

Pol S 461. (3-0; 3-0)

International Organization—A study of the historical development, structure and functions of international organizations, with special emphasis on the League of Nations, United Nations and Specialized Agencies.

Pol S 463. (3-0; 3-0)

Developments in World Politics Since 1945—A survey of the major developments in world politics since 1945, with special emphasis on the foreign policies of the major powers.

Prerequisite: Political Science 200 or consent of the department.

Pol S 465. (3-0; 3-0)

International Relations and World Law—The nature of international law; the function of international law in society; the universal character of international law; the state and other international persons; sovereignty and equality; recognition of governments and states; territorial problems; jurisdiction and limitations; civil war and intervention; war and neutrality; international institutions; world government.

Honors and Graduate Courses—

Pol S 501. (3s-0; 3s-0)

Comparative Political Institutions—A comparative study of the political institutions of democratic and non-democratic states.

Pol S 510. (3s-0; 3s-0)

Advanced Political Thought—A detailed analysis of certain major political theories.

Prerequisite: Political Science 310, or the consent of the department.

Pol S 541. (3s-0; 3s-0)
Seminar in Soviet Politics—An advanced study of several areas of Soviet domestic politics.
Prerequisite: Political Science 340, or the consent of the department.

Pol S 543. (3s-0; 3s-0)
Seminar in Slavonic and Soviet Studies—An Interdepartment Seminar.

Pol S 593. (3s-0; 3s-0)
Political Behaviour—A study of government and politics from a sociological and psychological point of view including the study of parties and pressure groups, public opinion, voting in elections and voting in legislatures.

Pol S 600. (3s-0; 3s-0)
Political Institutions

Pol S 601. (3s-0; 3s-0)
Federalism

Pol S 603. (3s-0; 3s-0)
Comparative Government

Pol S 605. (3s-0; 3s-0)
Systematic Study of Politics

Pol S 610. (3s-0; 3s-0)
Political Theory

Pol S 613. (3s-0; 3s-0)
Seminar in Soviet Political Theory

Pol S 615. (3s-0; 0-0)or(0-0; 3s-0)
Empirical Political Theory

Pol S 616. (3s-0; 0-0)or(0-0; 3s-0)
Normative Political Theory

Pol S 621. (3s-0; 3s-0)
Government of Canada

Pol S 641. (3s-0; 3s-0)
Research in Soviet Government

Pol S 651. (3s-0; 3s-0)
Public Administration

Pol S 660. (3s-0; 3s-0)
Theories of International Politics

Pol S 661. (3s-0; 3s-0)
International Politics

Pol S 663. (3s-0; 3s-0)
Problems of International Organization: Political and Security

Pol S 665. (3s-0; 3s-0)
Problems of International Organization: Economic and Social

Pol S 675. (3s-0; 3s-0)
Government and Politics in India and Pakistan

Pol S 680. (3s-0; 3s-0)
Western European Democracies

Pol S 690. (3s-0; 3s-0)
Political Behaviour

PSYCHOLOGY*

Professors—J. R. Royce (Head), D. E. Smith, W. A. S. Smith, L. von Bertalanffy.
Associate Professors—N. M. Ginsburg, A. J. B. Hough, E. Howarth, T. Nelson, P. P. Rempel, W. N. Runquist, W. W. Rozeboom, D. Spearman, R. G. A. Stretch, P. Swartz, K. V. Wilson.
Assistant Professors—W. Blanchard, B. G. Rule, S. J. Rule, B. H. Schaeffer, D. L. Schaeffer, R. E. Walley, T. E. Weckowicz.
Visiting Professors—K. Dabrowski, H. C. Steinmetz.
Sessional Lecturer—C. Larsen.
Sessional Instructor—A. A. Chermes.
Research Associate—A. B. Carran.

Honors Programs

The Department offers both the B.A. and the B.Sc. degrees with honors in Psychology. Students wishing to emphasize the Humanities and Social Sciences in their program should register for the B.A.; those who wish to emphasize the Physical and Biological Sciences should register for the B.Sc.

Honors in Psychology will require six to ten courses in Psychology including the following: Psychology 202, 309; one Science course with lab; one Arts course; and the Honors Seminar 501. The Honors Seminar must be taken each year that the student is in residence in the Honors program at the University, with the exception of the Freshman Year. A minimum of five courses will be taken in related subjects. The courses in related subjects might be all in one field (e.g. Mathematics or Biology) or in several, depending on the student's special interest and relevance of the courses to the subject matter of Psychology.

In addition a minimum of five optional courses will be chosen; some of these will be integrated with the program in Psychology while others must be general options.

An important feature of the Honors program is the opportunity for the student to engage in independent study and research. During the fourth year the student will write an Honors thesis under the guidance of a member of the Department.

In addition to the regular Honors Seminar, all fourth-year Honors students will be required to register in Psychology 600.

Advice to General Program Students

The Department of Psychology offers courses leading to both the B.A. and B.Sc. degrees. Students wishing to emphasize the Biological Sciences in their programs should register for the B.Sc. and follow one of the sequences sug-

*See also Faculty of Science section of the Calendar

gested in the Faculty of Science Calendar. Students wishing to emphasize the Humanities and Social Sciences should register for the B.A. and follow one of the following sequences:

Three course sequence: Psychology 202; Psychology 309; one half-course (with laboratory) listed in the Calendar of the Faculty of Science; one senior Psychology course listed in the Calendar of the Faculty of Arts.

Four or five course sequence: As above, plus either one or two senior Psychology courses which may be chosen from the Calendar of either faculty.

Junior Courses—

Psyco 202. (3-0; 3-0)

Introduction to General Psychology—A survey of problems, methods and principles in various fields of psychology.

Psyco 212. (3-0; 3-0)

General and Developmental Psychology—A survey of problems, methods and principles in several fields of psychology, with particular emphasis on child, adolescent and adult development and behaviour.

(This course is designed primarily for students in professional schools, such as Nursing and Physical Education, and is not open to students with credit in another introductory course in Psychology.)

Senior Courses—

Psyco 320. (3-0; 3-0)

Psychology Applied to Business and Industry—Methods and results of psychological studies in such fields as:

(a) selection, placement, training and supervision of personnel;
(b) promotion of efficiency and safety in production;
(c) advertising, selling and consumer research.

Psyco 337. (3-0; 0-0)or(0-0; 3-0)

Individual Differences—A survey of the biological and social conditions contributing to variations among individuals; methods for describing individuality.

Corequisite: Psychology 309 or consent of department.

Psyco 341. (3-0; 0-0)or(0-0; 3-0)

Social Psychology—An introduction to the study of individual and group behaviour observed in social processes.

Prerequisite: Psychology 202 or Sociology 202.

NOTE: Psychology 341 and Sociology 341 may not both be taken for credit.

Psyco 353. (3-0; 0-0)or(0-0; 3-0)

Developmental Psychology—A study of behaviour as it is related to normal development and aging.

Psyco 383. (3-0; 0-0)or(0-0; 3-0)

Personality—An introductory survey of the area of personality including a study of representative theoretical points of view and research relevant to the major problems in this area.

Prerequisite: Psychology 202.

Psyco 431. (3-3; 0-0)or(0-0; 3-0)

Theory and Practice of Psychometrics—The nature of psychological tests, with practical work in administration, scoring and interpretation of tests.

Prerequisite: Psychology 202 and 309, or consent of the department.

Psyco 441. (3-2; 0-0)or(0-0; 3-2)

Experimental Social Psychology — Basic research design, techniques and procedure in experimental studies in social psychology. Independent investigation in such areas as group dynamics and psycholinguistics.

Prerequisite: Psychology 202 or Sociology 202; Psychology 309 and one half-course in Experimental Psychology, or consent of the department.

Psyco 447. (3-0; 0-0)or(0-0; 3-0)

Psychology of Religion

Prerequisite: Psychology 202 and 383, or consent of department.

Psyco 489. (3-0; 0-0)or(0-0; 3-0)

Abnormal Psychology—A general introduction to abnormal psychology.

Prerequisite: Psychology 202 and consent of the department.

Psyco 490. (0-0; 3-0)

Psychology of Alienation—An examination of the psychological aspects of such conditions as loneliness, meaninglessness, existential anguish, and isolation.

Prerequisite: Psychology 341 or Sociology 341 or Psychology 489.

Psyco 492. (3-0; 0-0)

Creativity—An examination of the views and research concerning the creative process, including an attempt at understanding the manifestations of the creative process in different fields.

Prerequisite: Consent of the department.

NOTE: Open to senior students in any department. Some effort will be made to select students with diverse academic training.

Psyco 501 (3-0; 3-0)

Honors Seminar—A discussion of current topics in Psychology. Required of all students enrolled in Honors during their second, third and fourth years.

Psyco 502. (3-0; 3-0)

History and Systems—An historical survey of problems and theories in Psychology, including modern systems of Psychology.

Psyco 504. (3-0; 0-0)

Conference Course

Psyco 505. (0-0; 3-0)

Conference Course

Psyco 520. (3-0; 3-0)

Seminar in Industrial Psychology

Prerequisite: Psychology 320.

Psyco 535. (3-3; 3-3)

Clinical Assessment I—Tests of intellectual function from Binet to the present.

Prerequisite: Psychology 431 or consent of instructor.

Psyco 536. (3-3; 3-3)

Clinical Assessment II—Theory of projective tests, with study of the Rorschach and the various drawing and thematic tests.

Prerequisite: Psychology 535 or consent of Department.

Psyco 538. (3-3; 3-3)

Clinical Assessment III—An intensive study of a wide range of diagnostic tests for special behavioral conditions.

Prerequisite: Psychology 536 or consent of Department.

Psyco 540. (3-0; 3-0)

Seminar in Social Psychology

Psyco 550. (3-0; 0-0) or (0-0; 3-0)

Experimental Analysis of Personality—Latest techniques for measurement and experimental study of such personality factors as neuroticism, anxiety, hysteria, extroversion, conflict, and motivation structure.

Prerequisite: Psychology 202 and 383, or consent of department.

Psyco 574. (2s-0; 2s-0)

Seminar in Philosophy and Psychology—A study of the fundamental methodological, conceptual and philosophical issues in psychology.

Prerequisite: Advanced standing in philosophy or psychology.

NOTE: Psychology 574 and Philosophy 574 may *not* both be taken for credit.

Psyco 583. (3-0; 3-0)

Personality and Social Psychology—A survey at an advanced level of the general areas of Differential and Social Psychology. In the first half of the course emphasis will be placed on representative theoretical points of view and research relevant to the major problems in the area of personality. In the second half of the course emphasis will be on social influences on behavior.

Psyco 584. (3s-0; 3s-0)

Seminar in Personality Theory

Prerequisite: Psychology 383 and 583, or consent of department.

Psyco 586. (3-0; 3-0)

Normality, Neurosis, Sociopathy—A study of views of normality, theories and syndromes of neurosis and sociopathic personality.

Prerequisite: Psychology 489 or consent of instructor.

Psyco 588. (3-0; 3-0)

The Psychoses—The symptoms and dynamics of the major functional psychoses.

Prerequisite: Psychology 586 or consent of Department.

Psyco 590. (3-0; 3-0)

Systems in Psychotherapy—A survey of important theoretical developments in psychotherapy.

Prerequisite: Psychology 588 or consent of Department.

Psyco 592. (3-3; 3-3)

Psychological Therapies—A study of psychological therapies, with practical instruction in selected techniques.

Prerequisite: Psychology 590 or consent of instructor.

Psyco 599. (3-3; 3-3)

Honors Thesis—Students in their fourth year of honors will pursue a research project under the direction of a member of the department.

Psyco 600. (2s-0; 2s-0)

Research Seminar—Reports by students and staff on current research in the department. Required each year of all graduate students in the Department of Psychology and for fourth year honors students.

Psyco 648. (3-3; 0-0)

Research

Psyco 649. (0-0; 3-3)

Research

Psyco 698. (3-3; 0-0)

Advanced Research

Psyco 699. (0-0; 3-3)

Advanced Research

RELIGIOUS STUDIES

Rel St 350. (3-0; 3-0)

Comparative Religion—This course deals with recent advances in the scientific study of religions which have broadened historical perspectives and contributed to the mutual appreciation of the cultural values of East and West. Religions of primitive and civilized cultural levels are delineated, and an attempt is made to illuminate distinctive religious features of modern Western civilization.

ROMANCE LANGUAGES

Professors—E. J. H. Greene (Head), C. H. Moore.

Associate Professors—A. B. Connell, E. Dorfman, M. Faucher, J. Ferrate, A. M. Forcadas, C. G. Moore, R. G. Motut, G. Samuel.

Assistant Professors—A. J. Ballah, E. D. Blodgett, Carla Colter, J. A. D. Creore, J. A. Dainard, A. Holden, M. Kalinowski, E. Marxheimer, P. A. R. Monod, D. Musacchio, E. Musacchio, J. Polo.

Honors in Romance Languages

Honors programs in Romance Languages provide two years of general culture and two years of specialized studies. A student may therefore enter Honors at the end of the first or second year of the general B.A., if he has the required standing and the necessary prerequisites.

Two types of program are offered. The first is designed for students wishing to concentrate on French or Spanish, with a second Romance Language as a minor, and consists of seven or eight courses in the major, three or four in the minor, and eight to ten approved options, for a total of twenty courses. The second is designed for students wishing to acquire a broader base in the Romance field, and consists of six or seven courses in the major, four or five courses in the first minor, three in the second minor, and not fewer than six approved options, for a total of twenty courses. All programs must include a science course in the first year and, in subsequent years, such laboratory and practical hours as may be deemed necessary to improve the students' oral proficiency.

Combined Honors

A degree with Honors in French or Spanish and an approved second subject such as Latin, English, German, Russian or Ukrainian, will be awarded to students successfully completing a program of studies similar to the one outlined above, except that the number of senior courses will be as nearly as possible equal in each of the two languages. All such programs must be approved by both the departments concerned.

FRENCH

Advice to General Program Students

The following sequences are recommended to students choosing French as a subject of concentration:

1. For students beginning the language at the University: French 100 in the first year; French 200 in the second; up to three of French 330, 350, 360, 370, in the third year.
2. For students entering the University with matriculation French: French 200 in the first year; one or two of French 330, 350, 360, 370, in the second year; one or two of 350, 360, 375, 380, 400, in the third year. year.

Neither French 330 nor 350 may be taken *after* any of the other senior courses.

French-speaking students and students beginning the B.A. with more than matriculation French should arrange with the Department, before registering, to take a placement test, in order that they may start their sequence with the appropriate course.

Junior Courses—

Fren 100. (5-0; 5-0)

Beginners' French—French 100 is designed to enable students entering with complete matriculation but without French to begin their study of this language in the University.

NOTE: Normally, students will go from French 100 to French 200.

Fren 200 (3-1; 3-1)

First Year University French—This is an intensive course in spoken and written French. The course includes grammar, composition and literature.

Fren 201 (2-3; 2-3)

First Year University French for Teachers—This course is designed to teach all future teachers of French to speak the language. It consists of three laboratory hours of laboratory work and two hours of grammar per week.

NOTE: Arts students must obtain permission of the Dean before registering in this course.

Senior Courses—

Fren 302. (0-1; 0-1)

French Pronunciation for Second Year Honors Students

Fren 330. (3-0; 3-0)

French Language and Civilization—This course is especially designed to improve both the spoken and written language of students. It consists of literary selections from representative French authors, contrastive phonetics of French and English, oral work in class and intensive drill in the language laboratory.

Fren 350. (3-0; 3-0)

Introduction to French Literature—The study of major literary works from Villon to Camus.

Prerequisite: French 330 or consent of the Department.

Fren 360. (3-0; 3-0)

Eighteenth Century—A study of the literature and the evolution of ideas in the eighteenth century: Fontenelle, Marivaux, Montesquieu, Voltaire, Diderot, Rousseau, Beaumarchais.

Prerequisite: French 350 or consent of the Department.

Fren 370. (3-0; 3-0)

Romantic Period—A study of the history and development of French romanticism. The poetry and romantic drama of Lamartine, Dumas père, Hugo, Musset and Vigny.

Prerequisite: French 350 or consent of the Department.

Fren 375. (3-0; 3-0)

Realism—This course deals with the definition and history of realism, the development of the novel: Stendhal, Mérimée, Balzac and Flaubert, and the poetry of Baudelaire.

Prerequisite: French 350 or consent of the Department.

Fren 380. (3-0; 3-0)

Prose and Poetry of the Late Nineteenth Century—A study of naturalism in the novel and of the Parnassian and Symbolist schools of poetry.

Prerequisite: French 350 or consent of the Department.

Fren 398. (3-0; 3-0)

Introduction to Medieval French Literature

Prerequisite: One Senior French course.

Fren 400. (3-0; 3-0)

Seventeenth Century—This course consists of a study of the literature and society of the seventeenth century in France. The classical theatre: Corneille,

Molière, Racine; the novel; Descartes; Pascal; La Rochefoucauld and La Bruyère; La Fontaine.

Prerequisite: One senior French course.

Fren 403. (1-0; 1-0)
Third Year Honors French Language Seminar

Fren 420. (3-0; 3-0)
Introduction to French-Canadian Literature
Prerequisite: Two senior French courses.

Fren 450. (3-0; 3-0)
Contemporary French Authors
Prerequisite: Consent of the department.

Fren 500. (3-0; 3-0)
Special Reading Course—For graduate students who wish to prepare themselves for the M.A. or Ph.D. language requirement.

Honors and Graduate Courses—

Fren 510. (3-0; 3-0)
Seminar in French Composition—For fourth year Honors and Graduate students. An intensive training in the preparation and oral presentation of reports in French.

Fren 600. (3-0; 3-0)
Seminar in Medieval French Literature

Fren 601. (3-0; 3-0)
History of the French Language

Fren 610. (3-0; 3-0)
Seminar in French Renaissance Literature

Fren 612. (3-0; 3-0)
The Spirit of Humanism in France and England at the Beginning of the Renaissance

Fren 614. (3-0; 3-0)
Rabelais

Fren 616. (3-0; 3-0)
Ronsard

Fren 618. (3-0; 3-0)
Montaigne

Fren 619. (3-0; 3-0)
Seminar in Seventeenth-Century Literature

Fren 620. (3-0; 3-0)
The French Moralists
(Not confined to the Classical period)

Fren 625. (3-0; 3-0)
Molière

Fren 629.
Seminar in Eighteenth-Century Literature

Fren 630. (3-0; 3-0)
The Eighteenth Century Novel

Fren 634. (3-0; 3-0)
Marivaux

Fren 636. (3-0; 3-0)
Voltaire

Fren 638. (3-0; 3-0)
Rousseau

Fren 640. (3-0; 3-0)
Seminar in Nineteenth-Century Literature

Fren 645. (3-0; 3-0)
Stendhal

Fren 648. (3-0; 3-0)
Literature and the Plastic Arts from the Time of Delacroix and Baudelaire

Fren 651. (3-0; 3-0)
The Naturalistic Novel

Fren 655. (3-0; 3-0)
The Late Nineteenth Century Theatre

Fren 660. (3-0; 3-0)
Seminar in Twentieth-Century Literature

Fren 665. (3-0; 3-0)
Valéry

Fren 670. (3-0; 3-0)
Proust

Fren 699.
Conference Course—An honors or graduate course designed to meet the needs of individual students. It will consist of a detailed study of some great author or literary question not dealt with in the other honors or graduate courses.

SPANISH

Advice to General Program Students

The following sequences of courses are recommended to students choosing Spanish as a subject of concentration:

1. Spanish 100, 300 and 330, in a three course sequence;
2. Spanish 100, 300, 330 and 340, in a four course sequence;
3. Spanish 100, 300, 330, 340 and one of 360, 370, in a five course sequence.

Junior Courses—

Span 100. (5-0; 5-0)
Beginners' Spanish—A first course in Spanish grammar and pronunciation; an introduction to Spanish and Hispano-American civilization.

Senior Courses—

Span 201. (0-1; 0-1)
Second Year Honors Laboratory Hour

Span 300. (3-0; 3-0)
Second Year Spanish Authors and Grammar—An introduction to Spanish literature from the middle ages to the XIXth century. An intensive study of syntax and phonetics.

Span 302. (1-0; 1-0)
Third Year Honors Spanish Language Seminar

Span 330. (3-0; 3-0)
Contemporary Spanish Authors—A survey course on the development of Spanish peninsular literature from the Generation of 1898 to the most recent novelists, poets and playwrights.
Prerequisite: Spanish 300.

Span 340. (3-0; 3-0)
Spanish American Literature—A survey course on the main periods in the development of the national literatures of Spanish American, from the early XIXth century to the present.
Corequisite: Spanish 300 or 330.

Span 360. (3-0; 3-0)
Spanish Prose Fiction of the Golden Age—La Celestina and the dialogue novel up to Lope's *Dorotea;* the novela picaresca and other contemporary narrative genres (libros de caballerias, novela morisca, novela pastoril, etc.); Cervantes' *Don Quijote* and *Novelas ejemplares.*
Prerequisite or corequisite: Spanish 330.

Span 370. (3-0; 3-0)
Spanish Poetry and Drama from the late XVth Century to 1700—Their main forms and development through the Golden Age studied in a wide choice of texts.
Prerequisite or corequisite: Spanish 330.

Span 403. (1-0; 1-0)
Fourth Year Honors Spanish Language Seminar

Honors and Graduate Courses—

Span 503. (3-0; 3-0)
Spanish American Dialectology—A study of the phonetic, syntactic and semantic traits of American Spanish.

Span 540. (3-0; 3-0)
History of the Spanish Language

Span 550. (3-0; 3-0)
Medieval Narrative Poetry—A critical reading of the main extant texts, from the Peima de Mio Cid to Juan Ruiz's Libro de Buen Amor. A study of the formation of the Romancero.

Span 560. (3-0; 3-0)
Medieval Spanish Prose

Span 565. (3-0; 3-0)
Medieval Lyric Poetry

Span 600. (3-0; 3-0)
The Literature of the Discovery, Conquest and Colonization of America

Span 610. (3-0; 3-0)
The Sentimental Romances and the Books of Chivalry.
The Pastoral and Moresque Novel.

Span 612. (3-0; 3-0)
The Picaresque Novel

Span 615. (3-0; 3-0)
Cervantes

Span 620. (3-0; 3-0)
Sixteenth-Century Drama

Span 624. (3-0; 3-0)
Lope de Vega

Span 626. (3-0; 3-0)
Tirso de Molina and Juan Ruiz de Alarcon

Span 627. (3-0; 3-0)
Calderon

Span 630. (3-0; 3-0)
The Romancero

Span 633. (3-0; 3-0)
The Poetry of the Baroque Period

Span 635. (3-0; 3-0)
Gongora

Span 640. (3-0; 3-0)
Quevedo and Gracian

Span 650. (3-0; 3-0)
The Novel, Poetry and Drama of the Eighteenth Century

Span 660.
The Romantic Movement

Span 665. (3-0; 3-0)
Galdos and his Contemporaries

Span 670. (3-0; 3-0)
Contemporary Spanish and Spanish-American Poetry

Span 671. (3-0; 3-0)
Contemporary Spanish and Spanish-American Novelists

Span 675. (3-0; 3-0)
Unamuno

Span 699.

Conference Course—An honors or graduate course designed to meet the needs of individual students. It will consist of a detailed study of some great author or literary question not dealt with in other honors or graduate courses.

ITALIAN

A three course sequence is available to students beginning Italian at the University.

Ital 100. (5-0; 5-0)

Beginners' Italian—An introductory course in Italian grammar and pronunciation. Readings of easy texts dealing with different aspects of Italian culture to provide a background for further studies.

Ital 201. (0-1; 0-1)

Second Year Honors Laboratory Hour

Ital 300. (3-0; 3-0)

Second Year Italian—A study of selected contemporary prose and poetry. Advanced grammar and phonetics.

Prerequisite: Italian 100 or equivalent.

Ital 350. (3-0; 3-0)

Italian Literature in English Translation—The origins of the sonnet and the *canzone,* Dante's *Divine Comedy,* the works of Petrarch, the lyric madrigal, the early novelists from Boccaccio to Masuccio, new concepts of drama: *commedia dell' arte, commedia erudita* and early opera texts, Platonist writers and the Arts: Ficino, Leonardo da Vinci, Michelangelo, the Renaissance epic of Ariosto and Tasso, Marinismo and the Baroque.

Ital 360. (3-0; 3-0)

The Italian Theatre—Selected plays by Machiavelli, Ruzzante, Della Valle, Metastasio, Goldoni, Alfieri, Manzoni and Pirandello.

Prerequisite: Italian 300.

Ital 370. (3-0; 3-0)

Nineteenth Century Literature—A study centered upon the three major writers of the century: Foscolo, Manzoni, Leopardi.

Ital 400. (3-0; 3-0)

Renaissance Prose—Machiavelli's *Prince,* Castiglione's *Courtier,* Della Casa's *Galateo,* Cellini's *Autobiography,* Vasari's *Lives,* etc.

Prerequisite: Italian 300.

Ital 450. (3-0; 3-0)

Contemporary Italian Literary Aesthetics—Croce's aesthetics. Marxist criticism—Gramsci and G. della Volpe.

Prerequisite: Two senior Italian courses.

Ital 699.

Conference Course—An honors or graduate course designed to meet the needs of individual students. It will consist of a detailed study of some great author or question not dealt with in the other honors or graduate courses.

ROMANCE LINGUISTICS

Rom Lg 397. (3-0; 3-0)

Introduction to Romance Linguistics—General introduction to Linguistics; a descriptive-comparative treatment of modern French, Spanish and Italian; an outline of the main phonological and morphological changes leading from Latin to the Romance Languages.

Prerequisite: French 100 or Latin 100 or Spanish 100 or Italian 100 or equivalent.

Rom Lg 500. (3-0; 3-0)

Phonology: Synchronic and Diachronic—A study of the basic features of phonemic theory, synchronic and diachronic, with particular reference to the functional and structural analysis of linguistics expression in the Romance languages.

Prerequisite: Romance Linguistics 397 or Linguistics 370 or equivalent.

Rom Lg 505. (3-0; 3-0)

Comparative Romance Linguistics—An advanced course on the principles of comparative and historical linguistics, with emphasis on the linguistic evolution from Latin to modern French, Spanish and Italian.

Prerequisite: Romance Linguistics 397 or equivalent.

RUSSIAN

(See Slavonic Languages and Literatures)

SCANDINAVIAN

(See Germanic Languages and General Linguistics)

SLAVONIC LANGUAGES AND LITERATURES

Professor—O. Starchuk.
Associate Professor—Y. Slavutych.
Assistant Professors—W. Carey, J. Laychuk (Administrative Officer), W. R. Novakshonoff, G. Schaarschmidt.
Lecturers—T. Carlton, Oleh Zujewskyj.

Honors in Slavonic Languages

The Honors Program of the Department of Slavonic Languages is designed primarily to provide a sound knowledge of Russian or Ukrainian and other Slavonic languages and literatures in preparation for advanced study toward higher degrees and a professional or academic career.

The Department also offers:

(1) a program of study in Modern Slavonic Philology and Linguistics, with particular emphasis on either Russian or Ukrainian language, literature, and linguistics.
(2) a combined Honors program involving, for example, study of Russian and English, Russian and French, Russian and Latin, etc.
(3) a special program of studies of Central and Eastern Europe and Soviet Asia (see (d) below) in conjunction with the Departments of Economics, Geography, History and Political Science.

Degrees with Honors from this Department fall into these groups:

(a) B.A. with Honors in Russian with an approved second subject such as English, French, German, History, Latin, Spanish, Ukrainian, etc.;

(b) B.A. with Honors in Modern Slavonic Philology and Linguistics;

(c) B.A. in the combined Honors program;

(d) B.A. with Honors in Slavonic and Soviet Studies with Russian language and literature serving as the core.

Programs in group (a) will require a maximum of eight courses in the major, four to six in the second subject, and six to eight approved options (one of which must be a Science course in the first year), for a total of twenty courses. Programs in this group will be arranged in consultation with the departments concerned.

Programs in group (b) with major in either Russian or Ukrainian will require five courses in the language and literature of the major (East Slavonic), one or two in Polish (West Slavonic), one in Serbocroatian (South Slavonic), Departmental Seminar in Modern Slavonic Philosophy and Linguistics 650, English 200 and one Science course in the first year, one Russian history course, General Linguistics 350, Slavonics 540 or 550, Russian or Ukrainian 420, Comparative Slavonic Literature 620, and four or five approved options for a total of twenty courses.

Programs in group (c) will require that the number of senior courses in each subject be as nearly as possible equal and selected in accordance with departmental requirements.

Programs in group (d) will require seven courses in Russian, two or three courses in a second Slavonic language, Contrastive Slavonic Linguistics 540, the Seminar in Slavonic Linguistics 550, one Science course in the first year, four approved options, and four or five courses approved by an interdepartmental committee, in History, Economics or Political Science related to the Slavic area, for a total of twenty courses and one seminar.

All Honors students will take, in each year, such laboratory hours as may be deemed necessary to improve their oral proficiency."

RUSSIAN

Advice to General Program Students

The following sequences of courses are recommended to students choosing Russian as a subject of concentration:

1. Russian 100, 300 and 360, in a three course sequence;
2. Russian 100, 300, 360, and one of 320, 380 or 400, in a four course sequence;
3. Russian 100, 300 and 374, 360 and one of 320, 380, 390, 400, 420, in a five course sequence.

Junior Courses—

Russ 100. (3-2; 3-2)

Beginners' Russian (Arts Section)—This course is elementary and is designed to give a working knowledge of the Russian language. It provides a study of the essentials of grammar, reading, and drill on useful expressions.

Russ 201. (0-1; 0-1)

Practical Study of the Russian Language—Second year Honors laboratory hour.

Russ 210. (3-0; 3-0)

Beginners' Russian (Science Section)—This course is designed to meet the needs of honors students in the science departments, students of the faculties of Engineering, Agriculture, Dentistry, Medicine and Graduate Studies of any year who require a reading knowledge of Russian scientific literature.

NOTE: Not open to general program students.

Senior Courses—

Russ 300. (3-0; 3-0)

Second Year Russian (Arts Section)—Advanced Russian grammar, composition, and oral practice based on selected texts of Russian classical and contemporary literature.

Prerequisite: Russian 100.

Russ 302. (0-1; 0-1)

Practical Study of the Russian Language—Third year Honors laboratory hour.

Russ 310. (0-1; 0-1)

Second Year Russian (Science Section)—This course is a continuation of Russian 210. Russian scientific articles of current interest will be provided, discussed and translated. The course will give students a sufficient command of the language to enable them to translate advanced Russian texts in their fields of study.

Russ 320. (3-0; 3-0)

Selected Poetry Prose and Drama of the Nineteenth Century—Reading and literary study of selected poems, one play by Chekhov and one major classical novel.

Corequisite: Russian 300.

Russ 360. (3-0; 3-0)

Russian Literature of the Eighteenth and Nineteenth Centuries—Modern Russian Literature of the eighteenth and nineteenth centuries, including Classicism, Sentimentalism, Romanticism, Realism, and their foremost representatives. Social and political background. Advanced Russian grammar and composition based on short stories of the nineteenth cetnury. Authors studied include Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, Chekhov and L. N. Tolstoy.

Prerequisite: One senior Russian course.

Russ 374. (3-0; 3-0)

Contrastive Analysis of Russian and English—A contrastive analysis of the phonological and morphological systems of Contemporary Standard Russian and Modern English. The graphemic systems and syntactical patterns of Russian and English will also be discussed in this course.

Prerequisite or corequisite: Russian 300.

NOTE: This course is also listed under Linguistics 374.

Russ 380. (3-0; 3-0)

Russian Drama—History of the Russian Drama and a critical reading of five classics: Krylov's *The Lesson to the Daughters* (Urok dochkam), Griboyedov's *Woe from Wit* (ore ot uma), A. N. Ostrovsky's *The Thunderstorm* (Groza), Gogol's *The Inspector General* (Revisor) and Chekhov's *The Cherry Orchard* (Vishnevyi sad).

Prerequisite: One senior Russian course.

Russ 390. (3-0; 3-0)

Russian Composition and Conversation—This course, in which students will acquire a good command of the written Russian language, will include the study of difficult grammatical points with special emphasis on syntax. Compositions will be based either on literary works, read and discussed in class, or on the different types of Russian correspondence.

Prerequisite: Russian 300 and 360.

Russ 400. (3-0; 3-0)

Russian Literature of the Late Nineteenth and Early Twentieth Centuries—This course will cover the new literary movements of the period (the religious philosophers, mystical revolutionism, the aesthetic revival and the symbolists, socialist messianism) up to and including the principles of Socialist Realism of Soviet literature, with particular attention to the works of L. N. Tolstoy, Merezhkovsky, Ivanov, Blok, Bely, Balmont, Sologub, Remzov, Gumilëv, Mayakovsky, Akhmatova, Pasternak and others.

Prerequisites: Two senior courses in Russian.

Russ 403. (0-1; 0-1)

Practical Study of the Russian Language—Fourth year Honors laboratory hour.

Russ 420. (3-0; 3-0)

History of the Russian Language

Honors and Graduate Courses—

Russ 550. (3-0; 3-0)

The Russian Psychological Novel

Russ 570. (3-0; 3-0)

Soviet Russian Literature

Russ 580. (3s-0; 3s-0)

Slavonic and Soviet Studies: an interdepartmental seminar

Russ 610. (0-0;3-0)

Russian Mediaeval Literature

Russ 640. (3-0; 3-0)

Russian Poetry of the 18th and 19th Centuries

Russ 699.

Conference Course—This is an honors or graduate course to meet the needs of individual students. It will consist of a detailed study of some great author

or literary problem, directed reading and discussion. Courses offered: Pushkin, Lermontov, Gogol, Turgenev, Nekrasov, Dostoevsky, L. N. Tolstoy, Chekhov, Gorky. With the permission of the Department any other suitable subject may be studied in this course.

POLISH

Polish may be begun at the University. Polish 100 has the status of a first-year course and is credited towards a degree.

Polsh 100. (3-2; 3-2)

Beginners' Polish—This course is elementary and is designed to give a working knowledge of the Polish language. It provides a study of the essentials of grammar, reading and drill on useful expressions.

Polsh 201. (0-1; 0-1)

Practical Study of the Polish Language

Polsh 300. (3-0; 3-0)

Second Year Polish—Advanced Polish grammar, composition, and oral practice based on selected texts of Polish classical and contemporary literature.

Prerequisite: Polish 100 or consent of the department.

Polsh 360. (3-0; 3-0)

Survey of Polish Literature—A study of selected periods and works of Polish literature. Reading and discussion on the works of Polish writers including A. Mickiewicz, J. Slowacki, H. Sienkiewicz, B. Prus, and W. Reymont.

Prerequisite: One senior Polish course.

SERBO-CROATIAN

Ser-Cro 100. (3-2; 3-2)

Beginners' Serbo—Croatian—This course is elementary and is designed to give a working knowledge of Serbo-Croatian. It provides a study of the essentails of grammar, reading, and drill on useful expressions.

UKRAINIAN

Advice to General Program Students

The following sequences of courses are recommended to students choosing Ukrainian as a subject of concentration:

1. Ukrainian 100, 300, and 360 in a three course sequence;
2. Ukrainian 100, 300, 360, and 400, or 200, 330, 360, and 400 in a four course sequence.

Junior Course—

Ukr 100. (3-2; 3-2)

Beginners' Ukrainian—This course is elementary and is designed to give a working knowledge of the Ukrainian language. It provides a study of the essentials of grammar, reading and drill on useful expressions.

Ukr 200. (3-1; 3-1)

First Year University Ukrainian—This course is primarily designed for students having some previous knowledge of Ukrainian. It will consist of a brief

review of phonology, an intensive study of grammar. Readings of selected texts from modern Ukrainian literature, and elementary composition supplemented by laboratory work in conversational Ukrainian.

Prerequisite: Ukrainian 30 or the consent of the Department.

Ukr 201. (0-1; 0-1)

Practical Study of the Ukrainian Language—Second year Honors laboratory hour.

Senior Courses—

Ukr 300. (3-0; 3-0)

Second Year Ukrainian—Advanced Ukrainian grammar, composition, and oral practice based on selected texts of Ukrainian classical and contemporary literature.

Prerequisite: Ukrainian 100 or consent of the department.

Ukr 302. (0-1; 0-1)

Practical Study of the Ukrainian Language—Third year Honors laboratory hour.

Ukr 330. (3-0; 3-0)

Intermediate Ukrainian Language and Literature—A thorough review of Ukrainian grammar. Advanced points of syntax. Drill in basic speech patterns by means of dialogues. Ukrainian composition and translation assignments. Vocabulary-building through reading selected texts from Ukrainian classical and contemporary literature.

Prerequisite: Ukrainian 200.

Ukr 350. (3-0; 3-0)

Ukrainian Literature in English—English translations of selected works of the major authors of Ukrainian literature from Kotliarevsky to the present will be studied and discussed. The object of the course is to acquaint the English-speaking student with Ukrainian literature. This course is an Arts option for second, third, and fourth year students in all faculties. It is not open to honors students in the Slavonic Department.

Ukr 360. (3-0; 3-0)

Ukrainian Literature of the Nineteenth Century—A survey of nineteenth-century Ukrainian literature prior to 1918, including Classicism, Romanticism, Realism and Impressionism. The following authors are discussed: I. Kotliarevsky, H. Kvitka-Osonovyanenko, T. Shevchenko, I. Franko, L. Ukrainka, M. Kotsiubynsky, and others. Students are required to write essays in Ukrainian on suggested topics which will provide an opportunity for analyzing advanced elements of Ukrainian grammar and style.

Prerequisite: One senior Ukrainian course.

Ukr 390. (3-0; 3-0)

This course, in which students will acquire a good command of the written Ukrainian language, will include the study of difficult grammatical points with special emphasis on syntax and stylistics. Compositions will be based either

on literary works read and discussed in class, or on the different types of Ukrainian correspondence. Students will also deliver talks in Ukrainian in class.

Prerequisite: Two senior Ukrainian courses.

Ukr 400. (3-0; 3-0)

Ukrainian Literature of the Twentieth Century—This senior course consists of a study of Soviet Ukrainian literature with particular emphasis on the Literary Renaissance of the 1920's in addition to some treatment of Ukrainian literature abroad. The selected works of P. Tychyna, M. Rylsky, M. Khvylovy, Yu. Yanovsky, Ye Malaniuk, Yu. Klen, and M. Stelmakh, and others are discussed. On suggested topics students will compose papers in Ukrainian; special attention will be devoted to syntax and stylistics.

Prerequisite: Two senior Ukrainian courses excluding Ukrainian 350.

Ukr 403. (0-1; 0-1)

Practical Study of the Ukrainian Language—Fourth year Honors laboratory hour.

Ukr 420. (3-0; 3-0)

History of the Ukrainian Language—A study of the Historical development of the Ukrainian language.

Prerequisite: Two Ukrainian courses.

Ukr 610. (0-0; 3-0)

Old Ukrainian Literature

Ukr 630. (3s-0; 3s-0)

Seminar on Soviet Ukrainian Novelists—The course will consist of a detailed treatment of several representative Soviet Ukrainian novels. Students will be required to submit papers on approved topics to be discussed in class.

Prerequisite: Two senior Ukrainian courses.

Ukr 640. (3-0; 3-0)

T. H. Shevchenko—A study of the life and works of T .H. Shevchenko.

Prerequisite: Two senior Ukrainian courses.

Ukr 650. (3-0; 0-0)

I. Franko—A study of the life and works of I. Franko.

Prerequisite: Three senior Ukrainian courses.

Ukr 660. (0-0; 3-0)

L. Ukrainka—A study of the life and works of L. Ukrainka.

Prerequisite: Three senior Ukrainian courses.

Ukr 699.

Conference Course—This is an honors or graduate course designed to meet the needs of individual students. It will consist of a detailed study of some great author or literary problem, directed reading, and discussion. Courses offered: I. Kotliarevsky, T. Shevchenko, Marko Vovchok, P. Kulish, I. Nechuy-Levytsky, P. Myrny, I. Franko, L. Ukrainka, I. Karpenko-Kary, V. Vynnychenko, M. Rylsky, Y. Yanovsky. With the permission of the Department any other suitable subject may be studied in this course.

SLAVONICS

Slav 520. (3-0; 3-0)
Old Church Slavonic—This course is designed to acquaint the student with the first literary language of the Slavs. Readings in Old Church Slavonic will be included in the course.

Slav 540. (3-0; 3-0)
Contrastive Slavonic Linguistics

Slav 550. (3-0; 3-0)
Seminar in Slavonic Linguistics

Slav 600. (3-0; 3-0)
Early Literature of the Kievan Period

Slav 620. (3-0; 3-0)
Comparative Slavonic Literature

Slav 640. (3-0; 3-0)
Socialist Realism—Theory and Practice

Slav 650. (1s-0;1s-0)
Departmental Seminar on Modern Slavonic Philology and Linguistics
NOTE: Open only to honors and graduate students.

Slav 670. (3-0; 3-0)
Research Seminar—The study of research methods.
NOTE: Open only to graduate students.

Slav 680. (3-0; 3-0)
Slavonic Civilization

SOCIOLOGY AND ANTHROPOLOGY

Professors—G. K. Hirabayashi (Head), G. Nettler.
Associate Professors—H. Barclay, C. S. Brant, C. W. Hobart, R. Jones, W. E. Kalbach, S. Snyder, W. Watson.
Assistant Professors—B. R. Abu-Laban, J. T. Borhek, A. L. Bryan, K. R. Cunningham, A. D. Fisher, R. Frucht, R. Gruhn, J. Hackler, M. P. Hendrickson, C. A. S. Hynam, P. M. George, G. Kupfer, D. Larsen, H. W. Lungstrass, C. A. Meilicke, W. Meloff, R. Pike.
Lecturer—W. W. McVey.

SOCIOLOGY

Honors in Sociology

Degrees with Honors in Sociology will fall into two groups:
(1) B.A. with Honors in Sociology and an approved minor subject;
(2) B.A. with Honors in Sociology and Psychology.

There are several possible programs within each of these groups, and more detailed information is available from the Department. Students are advised to consult the Department for information before choosing one of the groups, and in any case, Departmental approval of the final program of studies is required before registration. In the case of students under (2), the program will be arranged in consultation with the Department of Psychology.

Honors in Sociology will require eight to ten courses in Sociology. Depending on the special interests of the students, five or six courses in a related minor subject will be taken. An additional five or six courses outside the field of Sociology and the minor area will be required to complete the program.

Honors in Sociology and Psychology will require seven courses in Sociology and seven in Psychology. In addition, six other courses will be required to complete the program.

Students in the honors programs are required to take a foreign language or a year course in statistics during the early part of the program.

In addition to final examinations in courses prescribed, students in the final year of each group will be required to write two comprehensive examinations, one of which may take the form of an essay paper.

Advice to General Program Students

Students interested in Sociology as a subject of concentration should take one of the following sequences:

Three course sequence: Sociology 202 and two senior Sociology courses;

Four course sequence: Sociology 202 and three senior Sociology courses (including one 400 level course);

Five course sequence: Sociology 202 and four senior Sociology courses (including one 400 level course).

Students interested in proceeding to graduate work in Sociology should consult the Department early in their University career.

Junior Course—

Soc 202. (3-0; 3-0)

Introductory Sociology—An introductory analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society is analysed in terms of its structure, culture and social ranking schemes. The interrelationships between the various institutions (e.g. family, church, school, government) are considered. The processes are examined whereby the individual is socialized into society, as are the sources of conformist and non-conformist behavior.

NOTE: Third year or more advanced students are encouraged to take Sociology 402 rather than 202.

Soc 311. (3-2; 3-2)

Statistics and Social Research—The logic and interpretation of statistical concepts and methods in the social sciences; measures of central tendency, variability and relationship; sampling and tests of hypotheses. Techniques of social measurement, data collection, and data processing. Experimental design.

NOTE: Accepted as a Science course in B.A. programs.

Soc 320. (3-0; 3-0)

Social Problems — An analysis of deviant behavior (e.g. crime, juvenile delinquency, drug addiction) and an analysis of social disorganization including world population crisis, urban and rural problems, industrial and other problems.

Soc 325. (3-1; 0-0)or(0-0; 3-1)

Criminology—A critical examination of the meaning and attempted explanation of crime and juvenile delinquency, with an analysis of the social processes leading to criminal behavior.

Prerequisite: One previous course in Sociology, or consent of the Department.

Soc 327. (0-0; 3-1)or(3-1; 0-0)

Penology and Corrections—The evolution and evaluation of the theories of punishment, the law and the courts, penal and reformatory institutions, probation and parole, a consideration of the various experiments in reform and rehabilitation.

Prerequisite: Sociology 325.

Soc 329. (0-0; 3-1)or(3-1; 0-0)

Juvenile Delinquency—Analysis of juvenile delinquency and its relation to adult crime; the social processes involved in the genesis and perceptions of styles of delinquency and their relationship to the community, and to various current theories of prevention and control, including the role of institutions and law.

Prerequisite: Sociology 325.

Soc 341. (3-0; 0-0)or(0-0; 3-0)

Social Psychology—An introduction to the study of individual and group behavior observed in social processes.

Prerequisite: Sociology 202 or 402 or Psychology 202 or Educational Psychology 276.

NOTE: Sociology 341 and Psychology 341 may *not* both be taken for credit.

Soc 343. (0-0; 3-0)or(3-0; 0-0)

Collective Behavior—Analysis of various forms of collective behavior, including crowds, mobs, panics, audiences, fashions, fads, cults, etc.

Prereqiusite: Sociology 341 or Psychology 341, or consent of the Department.

Soc 344. (0-0; 3-0)or(3-0; 0-0)

Mass Communication—The analysis of socio-psychological effects of mass media of communication, radio, television, movies, comic books, etc.

Prerequisite: Sociology 341, or Psychology 341, or consent of the Department.

Soc 345. (0-0; 3-0)or(3-0; 0-0)

Social Movements—Analysis of the genesis, development, effect, decline, and social psychology, of various religious, political, and economic movements.

Prerequisite: Sociology 341 or 376 or 377 or Psychology 341.

Soc 346. (0-0; 3-0)or(3-0; 0-0)

Public Opinion—A study of the nature of public opinion, factors involved in the formation of public opinion, and the roles of advertising, propaganda and education techniques in modern society.

Prerequisite: Sociology 341, or Psychology, or consent of the Department.

Soc 350. (3-0; 3-0)

Sociology of Community Development—A study of human communities; their institutional structure, ecological factors associated with patterns of growth, community relations, community planning and community development.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 352. (3-0; 3-0)

Population—World population trends and problems; social and cultural factors underlying fertility, mortality, and migration patterns and differentials; their relationship to the "population explosion", population composition and distribution; ecological theories and processes; urbanization; population theory and policy.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 356. (0-0; 3-0)or(3-0; 0-0)

Sociology of Rural Life—A study of the rural community and rural social systems, with special reference to changes in the rural way of life.

Prerequisite: Sociology 202 or 402, or consent of the Department.

Soc 360. (3-0; 3-0)

Social Class in Modern Society—An analysis of social stratification in western society, with reference to the effects of industralization, and including comparative analysis of primitive societies. Special attention given to the basis of stratification, the structure and function of social class systems, social mobility, and the special classes in modern society, such as the "managerial class", labor, and "power elite", etc.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 365. (0-0; 3-0)or(3-0; 0-0)

Leadership—Analysis of group interaction and the differentiation of leaders; the nature and techniques of leadership in various social systems.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 370. (3-0; 3-0)

The Family—Structure and function of the family, comparative family systems, sociology of family life stages (such as childhood, adolescence, adulthood, old age), contemporary trends and problems of the family.

Prerequisite: One previous course in Sociology, or consent of the Department.

Soc 376. (3-0; 0-0)or(0-0; 3-0)

Sociology of Religion—Sociological analysis of religious behavior in modern society. Special attention is given to the relationship between religion and social stratification, economics and social change.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 377. (0-0; 3-0)or(3-0; 0-0)

Value and Belief Systems—An analysis of the origins, developments and social consequences of systems of beliefs and values.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 380. (3-0; 3-0)

Minority and Ethnic Group Relations—A study of the problems arising from racial and minority status. An analysis of the sources of prejudice, current

theories of race and culture, and the effect of interracial and minority group contacts. An examination of critical situations requiring adjustment and social treatment.

Prerequisite: One previous course in Sociology, or consent of the Department.

Soc 391. (3-0; 0-0)or(0-0; 3-0)

Sociology of Work—A sociological analysis of the nature, functions, and meaning of work; work satisfactions and expectations, work motivations and rewards, work habits; personality, social role, and the division of labor; alienation and job morale; the milieu of modern work.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 392. (0-0; 3-0)or(3-0; 0-0)

Industry and Society—Analysis of the relations between industry and social stratification, minority groups, family, government, education, religion, and social change; the effects of automation and cybernation.

Prerequisite: Sociology 391.

Soc 393. (3-0; 3-0)

Political Sociology—A study of the social basis of political institutions and practices, and of the impact of these institutions and practices on society.

Prerequisite: Sociology 202 or 402 or Political Science 200.

Soc 394. (3-0; 3-1)

Medical Sociology—The role of sociology in medicine; analysis of sociological concepts in the field of medicine; review of recent research in areas such as attitudes toward illness and health, hospital organization, medical services, doctor-patient relationships.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 395. (3-1; 3-1)

Sociological Foundations of Social Work—The development of social work as a social institution; a consideration of various philosophies and practices of social work; social work as a part of community organization; current trends and problems; a study of the structure and function of private and public agencies. Field trips will be used.

Prerequisite: Sociology 202 or 402 or Psychology 202, and consent of department.

Soc 396. (0-0; 3-0)or(3-0; 0-0)

Industrial Sociology—A sociological analysis of the industrial system; bureaucracy; roles of executives, specialists, foremen, workers; formal and informal groups; trade unionism and management-labor relations; automation and cybernation. Field trips to local industries.

Prerequisite: Sociology 391.

Soc 402. (3-0; 3-0)

Principles of Sociology—A course in basic principles of sociology for students with advanced standing. Not given for credit to those with Sociology 202 credit.

Prerequisite: Senior or graduate standing.

Soc 410. (3-2; 3-2)

Sociological Analysis—Study of techniques used in sociological analysis; application of analytical techniques to social data, critical evaluation of presently used techniques and examination and development of alternative approaches.

Prerequisite: Sociology 310 or consent of department.

Soc 425. (0-0; 3-2)or(3-2; 0-0)

Research Problems in Criminology—Examination of theories of criminal behavior and various methods of testing the hypotheses emerging from these theories.

Prerequisite: Sociology 325, and either Sociology 310 or consent of the Department.

Soc 426. (0-0; 3-0)or(3-0; 0-0)

Criminal Control—Study of proposals advanced to control criminal behavior; the interrelationship of the social sciences with the law, law enforcement and welfare agencies.

Prerequisite: Sociology 325.

Soc 428. (0-0; 3-1)

Criminal Careers—Analysis of types of criminal behavior through the use of individual and limited case methods; social processes involved in the genesis and styles of crime as they apply to the involvement of the particular criminal and victim.

Prerequisite: Sociology 325.

Soc 430. (3-0; 3-0)

History of Sociological Thought—The historical roots of sociology, beginnings of modern sociology, and development of sociological theory to present times.

Prerequisite: Sociology 202 or 402 or consent of department.

Soc 431. (3-0; 3-0)

Social Change—A study of the significance of change in social and cultural systems; theories of social change, analysis of current trends and discussion of problems of induced change in selected cultures.

Prerequisite: Sociology 202 or 402 or consent of department.

Soc 435. (3-0; 3-0)

Canadian Society—A sociological analysis of the composition of the Canadian population; the value hierarchy, the nature and relationships of the major institutions, and the structure of Canadian Society.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 451. (3-0; 0-0)

Fertility and Society—Vital processes with special emphasis on the social, social-psychological and cultural correlates of fertility; problems of fertility prediction and control in large and small family societies; research methods and research problems.

Prerequisite: Sociology 352 or consent of the Department.

Soc 454. (3-0; 3-0)

Sociology of the Metropolis—The study of the contemporary metropolis with special reference to its ecological, demographic, institutional and social psychological characteristics and their interrelationships.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 455. (0-0; 3-0)

Migration—A study of internal and international migration and its relationship to resources and economic opportunities; the implications of population movement for societal organization.

Prerequisite: Sociology 352 or consent of the Department.

Soc 456. (3-0; 0-0)

Rural Social Problems and Public Policy—Social problems in Canadian rural life; analysis of policy making processes related to these problems.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 458. (0-0; 3-0)

Agrarian Social Movements—A sociological analysis of major agrarian social movements in North America.

Prerequisite: Sociology 202 or 402 or consent of the Department.

Soc 460. (3-0; 3-0)

Social Organization—Theories of social organization, analysis of such forms of social organization as kinship groups, bureaucracy, economic system, science, etc., and their interrelationship in functioning social systems.

Prerequisite: Sociology 202 or 402 or consent of department.

Soc 461. (3-0; 3-0)

Sociology of Occupation and Professions—Occupational recruitment, selection and induction; training and socialization, occupational mobility; job and career patterns; client-professional relationships; occupations and professional association; inter-occupational relations; work in complex organizations; the professionalization of occupations; public attitudes and occupational stereotypes.

Prerequisite: Sociology 202, or 402 or consent of department.

Soc 462. (3-0; 3-0)

Sociology of Leisure—Sociological analysis of leisure; its relation to work, personality, family, religion, education, social class, community, government and mass media.

Prerequisite: Sociology 202, or 402, or consent of the Department.

Honors and Graduate Courses—

Soc 500. (1s-0; 1s-0)

Second Year Honors Seminar

Soc 501. (1s-0; 1s-0)

Third Year Honors Seminar

Soc 502. (3-3; 3-3)

Conference Course in Sociology for Honors and Graduate Students — Arranged for various topics of sociology on the basis of special interest and need. Consent of department required.

Soc 505. (3s-0; 3s-0)

Seminar in Sociology of Modernization

Soc 510. (3s-2; 3s-2)

Research Seminar

Soc 519. (3s-0; 3s-0)

Selected Topics in Research Methodology

Soc 520. (3s-0; 3s-0)

Seminar in Deviance and Social Control

Soc 526. (3s-0; 0-0)or(0-0; 3s-0)

Seminar in Criminological Theory

Soc 527. (0-0; 3s-0)or(3s-0; 0-0)

Seminar in Correctional Theory

Soc 530. (3s-0; 3s-0)

Seminar in Sociological Theory

Soc 536. (3-0; 3-0)

Seminar in Sociology of Knowledge

Soc 540. (3s-0; 3s-0)

Seminar in Social Psychology

Soc 542. (3-2; 3-2)

Small Group Behavior

Soc 550. (3s-0; 3s-0)

Seminar in the Human Community

Soc 555. (3s-0; 0-0)or(0-0; 3s-0)

Seminar in Demography

Soc 560. (3s-0; 3s-0)

Seminar in Social Organization

Soc 562. (0-0; 3s-0)or(3s-0; 0-0)

Seminar in Social Class

Soc 570. (0-0; 3s-0)or(3s-0; 0-0)

Seminar in the Family

Soc 575. (3s-0; 3s-0)

Seminar in the Sociology of Symbolic Forms

Soc 590. (0-0; 3s-0)or(3s-0; 0-0)

Seminar in Industrial Sociology

Soc 594. (3s-0; 0-0)or(0-0; 3s-0)
Seminar in Medical Sociology

Soc 602. (3s-0; 3s-0)
Conference Course

Soc 610. (3s-0; 3s-0)
Advanced Seminar in Sociological Analysis

Soc 619. (3s-0; 3s-0)
Advanced Research

Soc 630. (3s-0; 3s-0)
Advanced Seminar in Theory

Soc 640. (3s-0; 3s-0)
Advanced Seminar in Social Psychology

Soc 642. (3s-0; 3s-0)
Experimental Small Group Research

ANTHROPOLOGY

Honors in Anthropology

B.A. with Honors will require eight to ten courses in Anthropology. Four to five courses will be taken in a related minor subject, depending upon the student's special area of interest in Anthropology. The remainder of the program will be composed of courses outside the field of Anthropology and the minor subject.

Before graduation students will be required to demonstrate a reading knowledge of a modern language other than English.

Departmental approval of the student's program must be secured prior to registration.

In the final year of the Honors program the student will be required to pass a comprehensive examination which may be written, oral or both; it may consist, in part, of a major research paper.

Advice to General Program Students

Students interested in Anthropology as a subject of concentration should take one of the following sequences:

Three course sequence: Anthropology 202 and two senior Anthropology courses;

Four course sequence: Anthropology 202 and three senior Anthropology courses (including one 400 level course).

Five course sequence: Anthropology 202 and four senior Anthropology courses (including one 400 level course).

Junior Course—

Anthr 202. (3-0; 3-0)
Introductory Anthropology—An introduction to the field of anthropology, including human paleontology, race, human prehistory, linguistics and ethnology.

Senior Courses—

Anthr 302 (3-0; 3-0)

Cultural Anthropology—The nature of culture; its uniformities and varieties; comparative study of primitive cultures in terms of family, clan, political organization, economic systems, religion, art, folk lore and social customs; processes of cultural change.

Anthr 305. (3-0; 3-0)

Culture and Language—An inquiry into the nature of human communication, its cultural conditions and consequences. Special attention will be given to the interrelations of the linguistic structures and habitual modes of behaviour and thought of various societies.

Anthr 350. (3-0; 3-0)

Indians of North America—A survey of the cultural and linguistic areas of aboriginal North America, and including a comparative and historical study of technology, social organization, economic systems, religions, art and languages. Some emphasis will be given to the Indians of Canada.

Anthr 360. (3-0; 3-0)

Peoples and Cultures of Middle and South America—Study of the history of cultural development and of the modern communities of the Indians of this region. Emphasis on continuity and change and the significance of Indian values and institutions in modern Latin America.

Anthr 371. (3-0; 0-0)or(0-0; 3-0)

Peoples and Cultures of Southeast Asia—Study of the major culture groups of Southeast Asia: Burma, Thailand, Malaya, Indochina, Indonesia; origins and development, modern forms and functioning, trends of change.

Prerequisite: A course in Anthropology or Sociology, or consent of the Department.

Anthr 372. (3-0; 0-0)or(0-0; 3-0)

Peoples and Cultures of South Asia—Study of the major culture groups of South Asia: India, Pakistan and Ceylon; origins and development, modern forms and functioning, trends of change.

Prerequisite: A course in Anthropology or Sociology, or consent of the Department.

Anthr 373. (3-0; 0-0)or(0-0; 3-0)

Peoples and Cultures of the Middle East—Study of the major culture groups in the predominantly Islamic region extending from Morocco to Afghanistan: origins and development; modern forms and functioning; trends of change.

Prerequisite: A course in Anthropology or Sociology, or consent of the Department.

Anthr 374. (3-0; 0-0)or(0-0; 3-0)

Peoples and Cultures of East Asia—Study of the major culture groups of East Asia: China, Japan, Korea. Origins and development; modern forms and functioning; trends of change.

Prerequisite: A course in Anthropology or Sociology, or consent of the Department.

Anthr 375. (3-0; 3-0)

Peoples and Cultures of Africa—Study of the native cultures with emphasis on the Sub-Saharan part of the continent. Special attention will be given to present day trends of change.

Prereqiusite: A course in Anthropology or Sociology, or consent of the Department.

Anthr 390. (3-2; 3-2)

Physical Anthropology—A study of human origins, evolution and variation: primates, fossil man, races of Homo sapiens. Anthropometric and genetic approaches to the analysis of human differences.

Prerequisite: Anthropology 202 or a course in Biology or Zoology, or consent of the Department.

NOTE: This course is accepted as a Science course in B.A. programs.

Anthr 395. (3-1; 3-1)

Prehistoric Archaeology—Archaeology as the anthropological approach to reconstruction and study of extinct, non-literate societies; archaeological techniques, methods and modes of interpretation; comparative analysis of the major prehistoric developments of the world.

Prerequisite: A course in Anthropology, or Classics 356, or consent of the Department.

NOTE: The same as Classics 395.

Anthr 402. (3-1; 3-1)

North American Archaeology—The peopling of North America and prehistoric development of culture as revealed by archaeological data. Special attention will be given to the archaeology of Canada.

Prerequisite: A course in Anthropology, or consent of the Department.

Anthr 415. (3-0; 3-0)

Comparative Social Systems—The comparative study of non-western societies in terms of lineage, clan and kinship systems; associations; caste and class systems; band, tribal and primitive state forms of political structure.

Prerequisite: a course in Anthropology or Sociology, or consent of the Department.

Anthr 416. (3-0; 3-0)

Anthropology and Education—The nature of anthropology and its relationships to the field of education. The transmission of culture in different societies, with reference to special Canadian communities.

Prerequisite: A basic course in Anthropology or Sociology, or consent of the Department.

Anthr 420. (3-0; 3-0)

Anthropology of Religion—A study of supernatural beliefs and practices in primitive and peasant cultures, including magic, shamanism, priesthoods, taboos and folk-beliefs. Special attention will be given to evolutionary, historical and functional theories of religion.

Prerequisite: A course in Anthropology or Sociology, or consent of the Department.

Anthr 425. (3-0; 3-0)

Creative Expression Among Non-Literate Peoples—A study of mythology, folklore, humor and the arts among non-literate peoples of the world. Emphasis will be placed on anthropological theory and method as applied to this field.

Prerequisite: A course in Anthropology or Sociology, or consent of the Department.

Anthr 440. (3-0; 3-0)

Culture and Personality—The role of culture formation; study of non-western cultures with reference to socialization practices and formation of adult character. Study of leading theories adduced by anthropologists in this field.

Prerequisite: a course in Anthropology, Sociology or Psychology, or consent of the Department.

Anthr 470. (3-0; 3-0)

American Indian Linguistics—A survey of indigenous languages of North America, with special reference to those spoken in Western Canada. A study of the distribution and structural characteristics of these languages, supplemented by laboratory work involving analysis of an American Indian Language, using a native speaker as informant.

Prerequisite: Linguistics 350.

Anthr 495. (3-3; 3-3)

Field Methods in Archaeology—The application of archaeological theory and methods to field problems.

Prerequisite: A previous course in Anthropology or consent of the Department.

Anthr 500. (3-0; 3-0)

Proseminar in Anthropology—An examination of recent and current research problems and approaches in the various branches of Anthropology: sociocultural; archaeological; physical; linguistic.

NOTE: Required of all first-year graduate students in Anthropology. Open to fourth-year Honors students in Anthropology with consent of the Department.

Anthropology 502. (3-3; 3-3)

Conference Course in Anthropology

Anthr 503. (3-3; 3-3)

Seminar in Cross-cultural Research

Anthr 504. (3-3; 3-3)

Methods in Ethnology and Social Anthropology

Anthr 510. (3-0; 3-0)

Theory of Culture—Study of past and current thought concerning the nature of culture and culture change, with attention to such concepts as cultural evolution, diffusion, invention, acculturation, patterns and themes. Relation of theory to problems of planned culture change in underdeveloped areas of the contemporary world.

Prerequisite: Open to fourth year honors or graduate students in Anthropology, or consent of the Department.

Anthr 590. (3-3; 3-3)
Advanced Physical Anthropology
Prerequisite: Anthropology 390 or consent of the Department.

Anthr 595. (3-3; 3-3)
Seminar in Archaeology

Anthr 596. (3s-3; 3s-3)
Field Methods in Archaeology

SPANISH

See Romance Languages

UKRAINIAN

See Slavonic Languages and Literature

IX

The Faculty of Business Administration and Commerce

INTRODUCTION

The curriculum of the Faculty of Business Administration and Commerce is based on two beliefs:

1. Education for business management is a life long process.
2. Universities can make their greatest contribution to this process by teaching the disciplines and fields of knowledge which underlie the practice of business. Details of current business practice, though important, can best be taught by business itself and learned through experience.

Business and its environment have changed enormously in the last twenty years and will change at an even faster pace in the next twenty. No school of business can possibly teach the solution of problems which will arise twenty years from now. A school should provide the best possible basis for effective life-long learning through actual experience. The school should not ask, "What should the businessman know?" but rather "Of all things he should know, what are best taught in the few years of academic, professional education?" Universities should teach the broad underlying fields of knowledge which are basic to business, and should treat the fields of business practice in comprehensive analytical framework, rather than teach recent or current business practice. Alfred North Whitehead, British philosopher and noted educator, stated this theory in simple words when he said that a properly educated man ". . . will remember by an unconscious common sense how to apply principles to immediate circumstances." In the first two years of the program, the student will take courses in the basic disciplines. Later he will be taught how this basic knowledge may be applied most effectively to the solution of the various problems of business in a general program or in a specialization of his choice which may be selected from the fields of economics, accounting, marketing, production, finance or industrial relations.

The Faculty is proud to number among its graduates many individuals now holding positions of trust and leadership in the Canadian business world. A review of the present activities of graduates since the Faculty was organized in 1928 indicates a wide diversity of occupations.

Advisory Committee to the Faculty of Business Administration and Commerce

To keep staff and students informed about latest trends in business and industry, a group of active leaders in the administration and direction of business enterprises have been invited periodically to meet with the academic staff of the Faculty.

These members are appointed by the Board of Governors upon nomination by the President of the University and the Dean of the Faculty of Business Administration and Commerce.

Mr. W. L. Arthur, Manager, Royal Bank of Canada, Edmonton

Mr. S. Belzberg, President, Belzberg Enterprises Ltd.

Mr. C. W. Clement, Q.C., Chairman Education Committee, Law Society of Alberta.

Mr. H. K. Collinge, Vice-President and Resident Manager, North Western Pulp and Power, Hinton.

Mr. G. R. Graham, Vice-President, Canadian National Railways.

Mr. H. H. Millar, President, Western Construction and Lumber Co., Ltd.

Mr. M. E. Stewart, President, Cdn. Western Natural Gas Co. Ltd. and Northwestern Utilities Ltd.

Mr. B. F. L. Symes, Resident Partner, Peat, Marwick, Mitchell & Co.

Mr. I. Telmer, Manager, Hudson's Bay Co.

Mr. J. M. Tweddle, Finance Commissioner, City of Edmonton.

Mr. M. Wolfe, President, Edmonton Motors Ltd.

Mr. W. H. Young, Plant Manager, Sherritt Gordon Mines Limited, Fort Saskatchewan.

Mr. W. S. Ziegler, President, Inland Cement Co.

The Faculty makes every effort to give the students opportunities to meet with business leaders and discuss some of the practical problems of business management. In particular, an annual Student Business Day is held during the month of November. At this time leaders in the business community are invited to participate.

Academic Staff of the Faculty

Dean—Hu Harries

Division of Business Analysis

Associate Professors—D. Goodale (Chairman), G. A. Feltham,* R. Pinola, L. S. Rosen

Assistant Professors—R. A. Denham, H. W. Ford, D. A. Harris, H. A. Kennedy, W. Sher

Sessional Lecturer—P. L. Herring

Division of Business Operations

Associate Professors—L. C. Leitch (Chairman), B. Rollins, D. N. Thompson*

Assistant Professors—M. Bartell, J. R. Paxton

Sessional Lecturers—

Division of Business Policy

Associate Professors—C. A. Lee (Chairman), R. E. Schneck, C. B. Williams

Assistant Professors—C. G. Hoskins, J. D. Muir, A. G. Perroni*

Sessional Lecturers—

*On leave of absence.

THE UNDERGRADUATE PROGRAM

(1) ADMISSION REQUIREMENTS

Students from Alberta high schools seeking admission to the Faculty of Business Administration and Commerce will be required to present:

(a) a High School Graduation Diploma with

(b) 50% or higher standing in the following Grade XII examination subjects:

1. English 30,
2. Social Studies 30,
3. Mathematics 30,
4. 5 and 6. *Three* of:
   Chemistry 30,
   Physics 30,
   Biology 30 (or 32 if taken before September, 1965)
   Mathematics 31
   French 30 or German 30 or Latin 30 or Ukrainian 30 or another language at an equivalent level; and

(c) an average in these six courses of at least 60%.

Candidates from outside Alberta will be required to meet equivalent standards and should submit their documents to the Registrar of the University for evaluation. (See III—Admission)

Note: Students who completed Grade XII in 1954 or earlier will be given full consideration for admission. They are advised to write to or see the Registrar of the University and to provide a complete transcript of their high school records.

These general regulations notwithstanding, the University may in its discretion refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements at the University of Alberta.

(2) PROMOTION AND GRADUATION

1. Promotion of the student from the first to the second year is contingent on the satisfactory completion in one year of a first year program of normal weight. The regulation applies also to students transferring from other universities.
2. Students must either pass 8 courses with a grade point of 6, of which not fewer than four must be courses taken in the third and fourth years., or obtain a grade point average of at least 5.0 over the last three years of the program.
3. If a grade point of 3 is obtained in a course:
   (a) Credit will be granted if all the following conditions are met:
      (i) G.P.A. for year is 5.50 or higher.

(ii) Course is not a prerequisite to another one in the student's program.
(iii) A student does not have more than two grade points of 3 in the degree program.

(b) If any of the above conditions are not fulfilled the student must write supplementals to obtain credit.

4. The Faculty of Business Administration and Commerce believes that it is important that each student have work experience in industry before graduation. This experience may have been obtained before entering University. If not, the student will be required to get it during the summer months.

In February of each year the student will be asked to describe the work he has done. In cases where the experience does not meet the requirements of the Faculty he will be advised.

5. All third year students must attend a special Banff Seminar which will be scheduled during the latter part of the normal final examination period.

6. All students of all years are required to attend Student Business Day held in the fall term of each year.

7. Students' attention is directed to the February and July deadlines in the academic schedule regarding application for Bachelor of Commerce degrees to be awarded at Spring and Fall Convocations.

(3) ACADEMIC HONORS

First Class Standing

First-class standing in a given year is awarded to any student who secures a G.P.A. of not less than 7.5 in the work of that year.

Degree with Distinction

The notation "With Distinction" will be inscribed on the permanent record and graduation parchment of a candidate for the B.Com. degree if the candidate has obtained a G.P.A. of 7.5 or higher over the last two years of his program.

Commerce Honors Society

This Society organizes and sponsors meetings of the Commerce Forum. The Commerce Forum invites outstanding people from within the University and outside the University to discuss matters of general educational interest. Membership in the Commerce Honors Society is restricted to students in the final three years of the program whose personality, ability and academic record are meritorious.

Applications for membership in the Commerce Honors Society must be submitted on the approved forms to the Dean's Secretary by October 10.

(4) THE PROGRAM

The undergraduate curriculum in the Faculty of Business Administration and Commerce is based upon a four year program leading to the Bachelor of Commerce degree. During the third and fourth years of the program the student may pursue a general course or he may major in Economics, Accounting, Industrial Relations, Finance, Production or Marketing.

Courses in the first two years of the program are offered from time to time in the Summer Session and Evening Credit Program. The final two years of the program may be taken only in the regular Winter Session.

First Year

Accounting 202
Business 202
Economics 200
English 210
Mathematics 240
Approved Arts or Science option
Physical Education

Second Year

Accounting 204
Business Law 310
Psychology 202
Computing Science 351
Mathematics 243
Busines Statistics 308
Business 320
Approved half-course option

Third Year

Finance 302
Industrial Relations 302
Marketing 302
Production 302
Business 354 or Business 355
An Economics or Commerce option.
The Economics or Commerce option is to be selected from the following courses according to the student's area of interest.

Accounting:	Accounting 300	Industrial Relations:	Economics 330
Economics:	Economics 501	Marketing:	Marketing 310
Finance:	Economics 340	Production:	Production 310

General: Any of the above

Fourth Year

Business 400
Arts or Science option
Three Economics and Commerce options, of which not more than two will be from the specialty.

Note: Commerce students planning to enrol in the Faculty of Education's business program must have competence in typing, or enroll before April 30 for Ed. Bus. 246 during the Summer Session.

THE GRADUATE PROGRAM

The Master of Business Administration Program is designed for students who desire a broad preparation for management positions in industry and government. Its emphasis is upon breadth of training rather than specialization. The central concept of the M.B.A. Program is the role of the administrator. Although functional areas of business such as finance, marketing and production are important elements in the program, they are only a part of, and subsidiary to, the primary purpose of the program—which is education for general managerial and administrative responsibilities.

The program provides professional training in business administration for outstanding students regardless of their undergraduate field of study.

(1) ENTRANCE REQUIREMENTS

No specific undergraduate major or series of courses is required for entrance. The program has been designed to accommodate those who have their undergraduate academic training in the liberal arts, engineering or the sciences, as well as commerce graduates.

Admission into the M.B.A. Program requires the applicant to meet the requirements of the Faculty of Graduate Studies and be approved by the Faculty of Business Administration and Commerce. Approval by the Faculty of Business Administration and Commerce depends upon the undergraduate grades, test score on the Admissions Test for Graduate Study in Business and practical experience of the applicant.

All applicants are required to write the Admission Test for Graduate Study in Business and have their scores forwarded to the Chairman of Graduate Studies, Faculty of Business Administration and Commerce. Write to Admission Test for Graduate Study in Business, Educational Testing Service, Princeton, New Jersey for further information about this test.

(2) THE PROGRAM

The first year of the program consists of accelerated undergraduate courses covering the areas of accounting, finance, marketing, production, research methods, statistics, and economic analysis. The second year is composed of three courses and a thesis. Two basic plans are available to students according to their undergraduate work.

PLAN I

A two-year plan for students with undergraduate degrees other than commerce.

First Year

First Term	Second Term
Business 457—Accounting	Business 457—Accounting
Business 458—Marketing	Business 456—Finance
Business 461—Elementary Statistics	Business 464—Business Analysis
Business 463—Business Analysis	Business 460—Research
Business 459—Production	Business 462—Business Statistics

Second Year

First Term	Second Term
Business 551—Administrative Policy	Business 551—Administrative Policy
Business 555—Business Policy	Business 556—Business Policy

and one of the following:

Accounting 560, Finance 561, Production 562, Marketing 563, Industrial Relations 564, Business Analysis 565.

1. A thesis is required.
2. Those wishing to take the advanced Production Seminar 562 must take an approved course in mathematics in the first year of the program. This may be done by deferring Business 463 - 464 to the second year.

PLAN II

A one-year plan for students with four-year Commerce degrees who have taken at least one course in each of the following areas: accounting, finance, business statistics, production, marketing, economics and business policy.

First Term	Second Term
Business 551—Administrative Policy	Business 551—Administrative Policy
Business 460—Research Methods	Business 556—Business Policy

and one of the following:

Accounting 560, Finance 561, Production 562, Marketing 563, Industrial Relations 564, Business Analysis 565.

1. A thesis is required.

(3) FINANCIAL ASSISTANCE

A limited number of fellowships and assistantships are available. Applications for fellowships should be made to the Faculty of Graduate Studies.. Applications for teaching and research assistantships should be made to the Dean of the Faculty of Business Administration and Commerce.

(4) HOW TO APPLY FOR ADMISSION

1. Write to Dean A. G. McCalla, Faculty of Graduate Studies, University of Alberta, Edmonton, Alberta, and request application forms.
2. Complete the application forms and related material; return to Dean A. G. McCalla, Faculty of Graduate Studies, University of Alberta, Edmonton, Alberta.
3. To be accepted for the 1966-67 academic year, applications must be received before August 31, 1966. Application should be made as early as possible.

For further information contact: Hu Harries, Dean
Faculty of Business Administration and Commerce
University of Alberta
Edmonton, Alberta.

DETAILS OF COURSES

The university reserves the right to modify or withdraw for the session any of the courses here outlined.

Students are reminded that regular attendance is expected in all courses.

NOTE: The weekly hours of instruction for both terms of the winter session are set out at the top of each course description. The first figure in each term indicates lecture-hours and the second laboratory-hours.

ACCOUNTING

Acctg 202 (0-0; 3-2)and(3-2; 0-0)

Fundamentals of Accounting—The language of accounting, forms of business organizations, preparation of financial statements.

Acctg 204 (0-0; 3-2)and(3-2; 0-0)

Management Accounting—Interpretaton of financial statements stressing managerial requirements.

Prerequisite: Accounting 202 or equivalent.

Acctg 270. (2-0; 2-0)

Legal Accounting—An elementary course with emphasis on areas of accounting useful to a practising solicitor

Note: For Non-Commerce students only.

Acctg 300. (3-2; 3-2)

Intermediate Accounting—An examination of basic accounting theory, accounting standards, and their application to the preparation of financial statements.

Acctg 411. (3-2; 3-2)

Advanced Accounting Theory—Accounting concepts applied to specific accounting problems, such as consolidation, mergers, refinancing and recapitalization will be considered in detail.

Acctg 421. (3-2; 0-0)

Cost Accounting—Cost concepts relevant to decision making. Techniques used in determining, analyzing and apportionment of costs. Discussion of costs for control purposes.

Acctg 431. (0-0; 3-0)

Auditing and Business Investigation—Auditing standards and applications; investigation of refinancing, purchase, credit, fraud or embezzlement.

Acctg 440. (3-0; 3-0)

Controllership Accounting—Accounting from the standpoint of management for analysis and control.

Acctg 560 (3-0; 3-0)

Advanced Seminar in Accounting—Open only to students registered in the Faculty of Graduate Studies.

AGRICULTURAL ENGINEERING

AgEn 342 (0-0; 3-0) and (3-0; 0-0)

Work Study—Time and motion techniques with critical path scheduling.

Note: This course will be allowed as an alternate for Production 421.

BUSINESS

Bus 202. (3-0; 3-0)

Introduction to Business—Survey of the place of business in society.

Bus 250. (3-0; 3-0)

Business Principles—Survey of the functional areas of business.

Note: For Non-Commerce students only.

Bus 300. (3-0; 3-0)

Administrative Principles—Functions of management-planning, organization, staffing, directing, controlling.

Note: For Non-Commerce students only.

Bus 308. (0-0; 3-3)

Introductory Business Statistics—Application of statistical methods to business problems. Measures of location and dispersion. Elementary probability. Binomial, normal and Poisson distributions. Prediction techniques. Index numbers. Time series.

Bus 320. (3-0; 3-0)

Business Analysis—Internal and external factors influencing prices, costs, output and growth of a business enterprise. Developments in organization analysis.

Bus 354. (3-0; 3-0)

Operations Analysis—Quantitative approach to Business problems. Theory and application.

Prerequisite: Mathematics 240, 243 and one other approved half-course in mathematics or statistics.

Bus 355. (3-0; 3-0)

Quantitative Methods—Introduction to analytical methods for business decisions.

Bus 400. (3-0; 3-0)

Business Policy—A study of policy-making in business, government and social fields with emphasis upon the application of the principles and techniques, acquired in the basic courses, to comprehensive problems.

Bus 456. (0-0; 3-0)

Finance—The management of funds and business operations from the viewpoint of the chief financial officer.

—open only to students registered in the Faculty of Graduate Studies.

Bus 457. (3-0; 3-0)

Accounting—The fundamental principles of accounting together with the elementary concepts and tools of analysis.

—open only to students registered in the Faculty of Graduate Studies.

Bus 458. (3-0; 0-0)

Marketing—The management of marketing operations.

—open only to students registered in the Faculty of Graduate Studies.

Bus 459. (3-0; 0-0)

Production—The management of production operations.

—open only to students registered in the Faculty of Graduate Studies.

Bus 460. (3-0; 0-0)or(0-0; 3-0)

Research Methods—The principles and techniques of business research.

—open only to students registered in the Faculty of Graduate Studies.

Bus 461. (3-0; 0-0)

Elementary Statistics—Elementary statistical methods applied to business decisions.

—open only to students registered in the Faculty of Graduate Studies.

Bus 462. (0-0; 3-0)

Business Statistics—Statistical methods applied to business decisions.

—open only to students registered in the Faculty of Graduate Studies.

Bus 463. (3-0; 0-0)

Business Analysis—Forecasting for the business firm.

—open only to students registered in the Faculty of Graduate Studies.

Bus 464. (0-0; 3-0)

Business Analysis—Forecasting for industry.

—open only to students registered in the Faculty of Graduate Studies.

Bus 470. (3-0; 3-0)

Government and Business—An examination of federal and provincial regulation of the economic system.

Bus 551. (3-0; 3-0)

Administrative Policy—A study of interpersonal relations, small group functioning and formal organization.

—open only to students registered in the Faculty of Graduate Studies.

Bus 555. (3-0; 0-0)

Business Policy—An examination of inter-firm and intra-firm relationships.

—open only to students registered in the Faculty of Graduate Studies.

Bus 556. (0-0; 3-0)

Business Policy—The social, political, cultural and ethical environment of business with the emphasis on the responsibilities of business leadership.

—open only to students registered in the Faculty of Graduate Studies.

BUSINESS ANALYSIS

Bus An 565. (3-0; 3-0)

Advanced Seminar in Business Analysis—open only to students registered in the Faculty of Graduate Studies.

BUSINESS LAW

B Law 310. (3-0; 3-0)

Commercial Law—An introduction to the study of Commercial Law with special reference to the law of contracts; Bills of Sale, Chattel Mortgages and conditional sales; sales of goods; bulk sales; contracts of hiring; contracts of carriage including bills of lading; negotiable instruments; guarantees; real property; commercial associations including companies, partnership and agency; master and servant.

COMPUTING SCIENCE

Cmput 351. (2-2; 2-2)

Electronic Data Processing—Introduction to punched-card procedure. Elementary programming concepts in basic machine language and compiler language. Commercial applications of computer techniques.

ECONOMICS

Econ 200. (3-0; 3-0)

Principles of Economics—A survey of various aspects of economics: the nature of economic problems and systems; the functions of money; commercial and central banking; national income analysis; monetary and fiscal policy; pricing under competitive and monopolostic conditions; selected topics in analysis and policy.

Prerequisite for all senior Economics courses except 310 and 311.

Econ 320. (3-0; 3-0)

International Economics—The basis of international trade, balance of payments problems, and related matters are analyzed theoretically and in relation to questions of economic policy. The development of the international economy since 1500 is surveyed, with emphasis on events since the Second World War.

Prerequisite: Economics 200 or 302.

Econ 330. (3-0; 3-0)

Labor Problems—A survey of the nature of labor economics and labor problems, including the various approaches of organized workers and employers to these problems. The approach of government to labor problems, including industrial disputes and social security. Applications of economic analysis to wages, unemployment and related problems.

Prerequisite: Economics 200 or 302.

Econ 340. (3-0; 3-0)

Money and Banking—The principles of money, monetary systems, commercial banking, central banking, monetary theory and policy, foreign exchange.

Prerequisite: Economics 200 or 302.

Econ 350. (3-0; 3-0)

Public Finance—A study of the conditions under which individual economic goals can be maximized through non-market mechanisms. Problems in the allocation of resources, redistribution of income, and stabilization of the level of resource utilization. A framework for analyzing taxes and the goals of a tax system. Patterns and trends in government expenditure and revenues. Objects, principles, and techniques of compensatory fiscal and debt policies.

Prerequisite: Economics 200 or 302.

Econ 380. (3-0; 3-0)

Macro-Economic Analysis—National income concepts and determination; the theory of aggregate consumption and investment; business cycle and growth applications of aggregate analysis.

Prerequisite: Economics 200 or 302.

Econ 401. (3-0; 3-0)

Economic Analysis—Micro- and macro-economic analysis; price and distribution theory; aggregate consumption, investment and income determination.

Prerequisite: Economics 301 or equivalent.

ENGLISH

Engl 210. (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

FINANCE

Fin 302. (2-0; 2-0)

Business Finance—An introductory course in corporate financial decision making, and the administration of a going concern.

Fin 400. (3-0; 3-0)

Insurance Principles—Nature of risk and uncertainty and the methods of meeting risk. The insurance mechanism, including types of carriers, contracts, and legal problems.

Fin 410. (3-0; 3-0)

Investment Principles; Security Analysis—Theories of investment with special reference to types of securities, prices and market operation.

Analytical techniques in the selection of securities.

Fin 421. (3-0; 0-0)

Taxation and Estate Planning—Current estate planning practices, with particular references to life insurance, succession duties, corporate and personal income taxes.

Fin 431. (0-0; 3-0)

Real Estate—The valuation of real estate, concepts and methods. Real Estate financing, including leasebacks and tax implications.

Fin 450. (3-0; 3-0)

Appraisal and Assessment—Techniques and principles governing the valuation of real and personal property for commercial and tax purposes.

Fin 561. (3-0; 3-0)

Advanced Seminar in Finance—Open only to students registered in the Faculty of Graduate Studies.

GEOGRAPHY

Geog 302. (3-0; 3-0)

Economic Geography—A study of the distribution of economic activities over the world. Resources, industries, and trade patterns are reviewed systematically and in place.

Geog 406. (3-0; 3-0)

Western Canada—A study of the resources, patterns of development and regions of Western Canada. The emphasis will be upon the developed parts of the Prairie Provinces and British Columbia.

Geog 410. (2L-1s; 2L-1s)

Geography in Planning—This course will cover selected historical, theoretical and practical aspects of land-use planning in various parts of the world. Physical and cultural aspects of planning projects and problems will be considered; techniques appraised.

Prerequisite: Consent of the instructor.

Geog 416. (3-0; 3-0)

Industrial Geography—A systematic geography focussing attention on manufacturing and raw materials transport, energy and markets in their areal context and in relation to manufacturing. Emphasis will be placed on the geographic analysis of the character of representative manufacturing areas including major manufacturing regions as well as underdeveloped territories.

Prerequisite: Geography 302 or consent of the instructor.

GEOLOGY

Geol 302.—R. A. Burwash (3-3; 3-3)

Geology and Mineral Deposits of Canada—The study of the geologic regions of Canada; their stratigraphy, structure, and mineral deposits.

Prerequisite: Geology 201 or consent of department. This course is sequential to Geology 201, and is designed for students not majoring in Geology.

HISTORY

Hist 370. (3-0; 3-0)

Canada—A survey of the political and social history of Canada.

INDUSTRIAL RELATIONS

IR 302. (2-0; 2-0)

A survey course in personnel administration, labor relations, and human relations.

IR 402. (3-0; 3-0)

An examination of the history, philosophy and significance of Federal and Provincial labour legislation.

IR 410. (3-0; 3-0)

Labor Relations—A detailed examination of negotiation techniques and of the day-to-day administration of the collective agreement.

IR 420. (3-0; 3-0)

Personnel Administration—An intensive examination of procedures for employee recruitment, selection, placement and training; job evaluation, merit rating, wage structure and employee communications.

IR 430. (3-0; 3-0)

Human Relations—A detailed study of work environment and motivations.

IR 564. (3-0; 3-0)

Advanced Seminar in Industrial Relations—Open only to students registered in the Faculty of Graduate Studies.

LANGUAGES OTHER THAN ENGLISH

French

Fren 100. (5-0; 5-0)

Beginners' French—French 100 is designed to enable students with complete matriculation but without French to begin their study of this language in the University.

Note: Normally, students will go from French 100 to French 200.

Fren 200. (3-1; 3-1)

First Year University French—This is an intensive course in spoken and written French. The course includes grammar, composition and literature.

Prerequisite: Grade XII French or French 100.

Italian

Ital 100. (5-0; 5-0)

Beginners' Italian—An introductory course in Italian grammar and pronunciation. Readings of easy texts dealing with different aspects of Italian culture to provide a background for further studies.

Spanish

Span 100. (5-0; 5-0)

Beginners' Spanish—A first course in Spanish grammar and pronunciation; an introduction to Spanish and Hispano-American civilization.

German

Germ 100. (3-2; 3-2)

Beginners' German—This course is designed to impart, on the introductory level, an active, practical skill in the use of the spoken and written word. The oral approach will be stressed, using material from everyday life situations, easy cultural readers, slides, charts, maps etc. The Department's language laboratory will be used for drill purposes and will also be available to students for individual practice.

Germ 200. (3-1; 3-1)

First Year University German—This course is devoted to the development of the student's ability in speaking, reading and writing German, using modern short stories, cultural readers and audio-visual aids.

Prerequisite: Matriculation German, German 100 or the equivalent.

Greek

Greek 100. (5-0; 5-0)

Beginners' Greek—An introductory course to enable students to begin Greek at University. It is concerned with essential grammar and vocabulary, the reading of easy Greek and simple sentences for translation into Greek.

Latin

Latin 100. (5-0; 5-0)

Beginners' Latin—This course is to enable students who enter the University without Latin to begin the study of this language in University. It is concerned with the essentials of grammar, syntax, the reading of easy Latin and prose composition. A secondary emphasis is placed on the connection of English with Latin.

Latin 200. (3-0; 3-0)

Latin Authors and Prose Composition—This course is for students with matriculation in Latin 30 or with Latin 100. It is concerned with improvement in the reading of Latin and with the writing of simple Latin sentences.

Polish

Polsh 100. (3-2; 3-2)

Beginners' Polish—This course is elementary and is designed to give a work ing knowledge of the Polish language. It provides a study of the essentials of grammar, reading, and drill on useful expressions.

Russian

Russ 100. (3-2; 3-2)

Beginners Russian (Arts Section)—This course is elementary and is designed to give a working knowledge of the Russian language. It provides a study of the essentials of grammar, reading, and drill on useful expressions.

Ukrainian

Ukr 100. (3-2; 3-2)

Beginners' Ukrainian—This course is elementary and is designed to give a working knowledge of the Ukrainian language. It provides a study of the essentials of grammar, reading and drill on useful expressions.

MARKETING

Mark 302. (2-0; 2-0)

Fundamentals of Marketing—The evaluation of markets and marketing, market structures, organization and behavior.

Mark 310. (3-0; 3-0)

Marketing Policies and Problems—Readings in the interdisciplinary contributions to marketing decision-making techniques and marketing analysis.

Mark 400. (3-0; 3-0)

Distribution—Executive determination of organizational structure, policy making, control policies, and general management problems in wholesaling and retailing operations.

Mark 410. (3-0; 3-0)

Sales Management: Purchasing—Sales analysis and forecasting, planning and policy determination, territorial and cost analysis. Problems faced in industrial procurement by various organizations.

Mark 420. (3-0; 3-0)

Advertising: Marketing Research—The basic concepts of advertising and study of the underlying psychology. Problems faced in the design and execution of marketing research.

Mark 432. (3-0; 3-0)

Advanced Marketing: Foreign Marketing—The integration of the marketing field at the top management level through case studies of marketing programs. Marketing functions, organization and structure in foreign trade.

Mark 563. (3-0; 3-0)

Advanced Seminar in Marketing—open only to students registered in the Faculty of Graduate Studies.

MATHEMATICS

Math 180. (4-0; 4-0)

Trigonometry and Polynomial Calculus—Trigonometric functions and identities. Solution of triangles. Simple algebraic curves. Differentiation and integration of elementary functions. Applications.

Prerequisite: Mathematics 30 or its equivalent.

Math 201. (5-0; 5-0)

Introductory Calculus—Rates of change. Differentiation and integration of simple functions. Applications. Analytic geometry of the conic sections. Exponential, logarithmic and trigonometric functions.

Prerequisite: Mathematics 30 and 31 or their equivalents.

Corequisite: Some students lacking Mathematics 31 or its equivalent may take Mathematics 201 by taking Mathematics 101 concurrently. (See the conditions under which a student may take Mathematics 101.)

Math 220. (3-0; 3-0)

Elementary Calculus—Differentiation and integration of trigonometric functions. Polar coordinates. Logarithmic and exponential functions. Conic sections. Areas and volumes.

Prerequisite: Mathematics 180.

Math 240. (3-1; 0-0) and (0-0; 3-1)

Elementary Calculus—Limits and derivatives. Differentiation of simple functions. Graphs, extrema and inequalities. Integration of simple functions. Infinite sequences and series.

Prerequisite: Mathematics 30 or equivalent.

Note: This course is designed as a prerequisite for Statistics 241.

Math 243. (3-2;0-0)

Linear Algebra—Vector and matrix operations. Linear systems of equation, dimension, axiomatic definition of vector space, constructive solution of linear equations, computation of inverses. Linear inequalities, convex sets, introduc-

tion to linear programming. Binary relations: equivalence, order, graphs. Invariants, canonical forms, eigenvalues and quadratic forms. Finite Markov chains.

Prerequisite: Mathematics 30.

Math 340. (0-0; 3-2)

Analysis, Difference and Differential Equations—Function of several variables. Partial derivatives, extreme values, Lagrange multipliers, complex numbers and exponentials. Euler's formula. Linear difference and differential equations with constant coefficients. Interpolation procedures. Systems of linear equations. Numerical solutions and iterative methods.

Prerequisite: Mathematics 240 or 242 or equivalent.

PHYSICAL EDUCATION

P Ed 218. (0-2; 0-2)

Recreational Activities—Emphasis on the fundamentals of the following recreational activities; Touch football, Borden ball, volleyball, badminton, basketball, tumbling, aquatics, circuit training, and golf. Course required of all first-year men.

P Ed 228. (0-2; 0-2)

Recreational Activities—Emphasis on the fundamentals of the following recreational activities; Tennis, aquatics, badminton, volleyball, basketball, social dancing and golf. Course required of all first year women.

PHYSICAL SCIENCE

Ph Sc 341. (3-0; 3-0)

Physical Science—A course designed for B.A. and B.Ed. students to give them some appreciation of fundamental ideas and methods in the physical sciences, of modern trends in this field, and of its relation to other disciplines. Illustrative material will be taken from Physics, Chemistry, Astronomy and Geology, and the history and development of the subject will be stressed.

Note: This course is not open to first year students and may not be taken for credit by students who have already taken Physics 100 or 200.

POLITICAL SCIENCE

Pol S 200. (3-0; 3-0)

Elements of Political Science—A study of the principles and practices of modern government, with emphasis on the democratic constitutional state. Among the topics studied are the nature and theory of the state; types of constitutions; the functions and composition of the legislature, executive and judiciary; representation; political parties and pressure groups.

Pol S 310. (3-0; 3-0)

History of Political Thought—A historical and critical survey of the development of political and social philosophy from Ancient Greece to the present time, with selected readings from major political writers.

Pol S 320. (3-0; 3-0)

Government of Canada—A study of the structure and functioning of the government of Canada, especially of the Commons, the Senate, the Cabinet System, the Civil Service; and the role of political parties.

PRODUCTION

Prod 302. (2-0; 2-0)

Fundamentals of Production—An introductory study of production management.

Prod 310. (3-0; 3-0)

Production Management—A study of production management with respect to the basic functional areas.

Prod 400. (3-0; 3-0)

Quantitative Analysis for Management—A quantitative approach to decision-making in management.

Prod 410. (3-0; 3-0)

Plant Location, Layout, Organization and Control—A study of the factors influencing plant location, layout, organization, and control.

Prod 421. (0-0; 3-0)

Motion and Time Study—Motion and time study techniques.

Prod 430. (3-0; 3-0)

Advanced Production Management—Advanced problems in planning and controlling production operations.

Prod 562. (3-0; 3-0)

Advanced Seminar in Production—open only to students registered in the Faculty of Graduate Studies.

PSYCHOLOGY

Psyco 202. (3-0; 3-0)

Introduction to General Psychology—A survey of problems, methods and principles in various fields of psychology.

Psyco 320. (3-0; 3-0)

Psychology Applied to Business and Industry—Methods and results of psychological studies in such fields as:

(a) selection, placement, training and supervision of personnel;
(b) promotion of efficiency and safety in production;
(c) advertising, selling and consumer research.

SOCIOLOGY

Soc 202. (3-0; 3-0)

Introductory Sociology—An introductory analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society is analysed in terms of its structure, culture and social ranking schemes. The interrelationships between the various institutions (e.g. family, church, school, government) are considered. The processes are examined whereby the individual is socialized into society, as are the sources of conformist and non-conformist behavior.

Note: Third year or more advanced students are encouraged to take 402 rather than 202.

Soc 320. (3-0; 3-0)

Social Problems—An analysis of deviant behavior (e.g. crime, juvenile delinquency, drug addiction) and an analysis of social disorganization including world population crisis, urban and rural problems, industrial and other problems.

Soc 390. (3-0; 3-0)

Industrial Sociology—A sociological analysis of the industrial system; industrial bureaucracy; the industrial roles of executives, specialists, foremen, office and plant workers; formal and informal groups; social structure of trade unionism; management-labour relations; industry in relation to social stratification, minority groups, family, government, technological and social change. Field trips to local industries.

Prerequisite: One other course in Sociology.

Soc 402. (3-0; 3-0)

Principles of Sociology—A course in basic principles of sociology for students with advanced standing. Not given for credit to those with Sociology 202 credit.

Prerequisite: Senior or graduate standing.

Soc 460. (3-0; 3-0)

Social Organization—Theories of social organization, analysis of such forms of social organization as kinship groups, bureaucracy, economic systems, science, etc., and their interrelationship in functioning social systems.

Prerequisite: Sociology 202 or 402 or consent of Department.

STATISTICS

Stat 241. (0-0; 3-1)

Elementary Probability—Elementary set theory. Finite sample spaces. Probability and Bayes' formula. Hypergeometric and binomial distributions. Moments, standardization and the law of large numbers. Deusity and distribution functions of continuous random variables. Expectation. Poisson and normal approximations of the binomial distribution.

Prerequisite: Mathematics 240 or equivalent.

Stat 305. (3-2; 0-0)or(0-0; 3-2)

Introductory Statistics—Tabulation, graphical representation and reduction of data. Measures of location and dispersion. Elementary probability. Binomial and normal distributions. Curve fitting and the chi-square test of goodness-of-fit. Elements of sampling. Testing statistical hypotheses, confidence intervals.

Prerequisite: Mathematics 30.

Stat 341. (3-2; 0-0)

Statistical Methods—Joint density and distribution functions. Central limit theorems and sampling distributions. Point and interval estimation. Desirable properties of estimates. Maximum likelihood estimation. Decision theoretic approach to statistical inference. Hypothesis testing as a two-decision problem, likelihood ratio, types of errors, power. Linear models: analysis of variance, regression, multiple comparisons, simple designs.

Prerequisite: Statistics. 241.

X

The School of Dental Hygiene

INFORMATION, REGULATIONS, COURSES

(1) GENERAL INFORMATION

At the request of the Government of Alberta, a two year program of training for Dental Auxiliaries was initiated within the Faculty of Dentistry, University of Alberta, in 1961. The teaching and training follows closely the requirements for Dental Hygiene with additional study in the subjects necessary for Dental Auxiliaries.

Students enrolled in the Dental Auxiliary program receive financial assistance from the Department of Public Health. Graduate Dental Auxiliaries are employed by the local health authority to serve with dental health teams. A two year return in service for financial assistance received is required of all graduate Dental Auxiliaries.

In 1962, a School of Dental Hygiene was established. The two year program for Dental Auxiliaries is now offered within the School. A two year program of study for Dental Hygienists leading to a Dental Hygiene diploma is also offered.

The School of Dental Hygiene is located in the Medical Sciences Building on the University of Alberta Campus in Edmonton. The Dental Hygiene Clinic is equipped with modern facilities and affords the students an opportunity to apply knowledge, learned skills and techniques for the improvement of dental health. The services offered in the Dental Hygiene Clinic are available by appointment to all students on the University of Alberta Campus and citizens of Edmonton and surrounding districts.

The Dental Hygiene program is approved by the Councils on Dental Education of the Canadian Dental Association and of the American Dental Association.

Licensure

A diploma from the School of Dental Hygiene does not, in itself, confer the right to practise. Dental Auxiliaries employed in the local health units of Alberta must be registered and obtain a licence to practise as described in The Dental Auxiliaries Act of the Province of Alberta. A Dental Hygienist desiring to practise Dental Hygiene in Canada should consult the appropriate provincial licensing body as listed below:—

Alberta—Registrar, Alberta Dental Association, 9901-108 Street, Edmonton, Alberta.

British Columbia—Registrar, College of Dental Surgeons of British Columbia, 325-925 W. Georgia Street, Vancouver, British Columbia.

Manitoba—Registrar, The Manitoba Dental Association, 308 Kennedy Street, Winnipeg, Manitoba.

New Brunswick—Registrar, College of Dental Surgeons of New Brunswick, 380 St. George Street, Moncton, N.B.

Newfoundland—Registrar, Newfoundland Dental Association, Campbell Building, 350 Water Street, St. John's, Newfoundland.

Nova Scotia—Registrar, Provincial Dental Board of Nova Scotia, 269 Cottingen Street, Halifax, Nova Scotia.

Ontario—Registrar-Secretary, Royal College of Dental Surgeons of Ontario, 230 St. George Street, Toronto 5, Ontario.

Prince Edward Island—Registrar, The Dental Association of Prince Edward Island, 162 Great George Street, Charlottetown, Prince Edward Island.

Quebec—Registrar, College of Dental Surgeons of the Province of Quebec, 801 Est, Rue Sherbrooke, Montreal, P.Q.

Saskatchewan—Registrar, The College of Dental Surgeons of Saskatchewan, 606 Canada Building, Saskatoon, Saskatchewan.

Dental Hygienists and Dental Auxiliaries are employed at all times under the supervision or direction of a fully qualified dentist.

Fees

See SECTION IV.

Uniforms

The student will be expected to have two lab. coats, two white uniforms and a pair of white oxfords. The lab. coats, uniforms and shoes will be purchased under the direction of the school.

Approximate Cost of Books

First year	$175.00
Second year	50.00

Approximate Cost of Instruments and Uniforms

First year	$225.00
Second year	25.00

Dental Auxiliary Bursary

A limited number of Public Health bursaries are available to students enrolled in the School of Dental Hygiene. Students receiving the bursaries will take the Dental Auxiliary program. Graduate Dental Auxiliaries will be expected to work for a two year period following graduation in designated health units of Alberta. Candidates who are residents of Alberta will be given priority to receive the financial assistance.

The financial assistance consists of $75.00 a month during the academic years, tuition fees and a book allowance of approximately $25.00. Applicants eligible to receive the bursary will be notified after Registration has been completed for the School of Dental Hygiene. Forms for the bursary will not be available before the day of registration and will be completed on that day.

(2) ADMISSION AND REGISTRATION

The programs of study are open to men and women but are particularly suited to young women. There is no minimum age requirement. Admission requirements for the School of Dental Hygiene are:

(a) a High School Diploma (Senior Matriculation) with

(b) a "B" or higher standing in the required courses of Grade XII. The required courses are as follows:—

(1) English 30

(2) Social Studies 30

(3) Chemistry 30

(4), (5), (6) Three to be selected from:
Physics 30
Mathematics 30
Biology 30 (or 32 if taken before Sept. 1965)
French 30 or German 30 or Latin 30 or Ukrainian 30 or another language at an equivalent level.

(c) an average in the six courses of at least 60%.

It is recommended that Biology 30 be selected as one of the optional subjects.

Students who have matriculated outside of the Province of Alberta and are seeking admission to the School of Dental Hygiene, must have a standing equivalent to the above mentioned requirements. No student will be accepted on a conditional standing.

These general regulations notwithstanding, the University may, at its discretion, refuse admission to any student. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to obtain nominal entrance requirements at the University of Alberta.

Enrolment in the School of Dental Hygiene is limited. Candidates will be selected according to academic standing. Consideration will be given to satisfactory personality and physique. Wherever possible, applicants should arrange a personal interview with the Director of the School prior to registration. Applicants are requested to have the Dental Examination Form (available from Registrar's Office or School of Dental Hygiene) completed by a dentist and returned to the Director of the School.

Registration

The Admissions Committee meets about the 20th of August to consider all applications for admission. During the following week, applicants will be informed whether they have been accepted or not. Registration will take place on the Thursday immediately following Labor Day. Each successful applicant will receive a notice indicating the time and place of registration.

Students should therefore not come to the University until they have received an official acceptance of their application.

Students in the School of Dental Hygiene may not carry a reduced academic load. If a student has been granted advance credit in a course, it is expected she will take an approved option in its place.

(3) PROMOTION AND GRADUATION

Students should read carefully the regulations in Part I of this Calendar concerning attendance and examinations. In addition, the following apply.

The records of all students will be reviewed at the end of each academic year by the Revisions Committee of the Faculty of Dentistry and the Council of the School. Recommendations for promotion and graduation will be based on a grade of at least 4 in each subject and a grade point average of at least 5. Information on the weighting of courses is available from the office of the Director. Students in the Dental Auxiliary program must satisfactorily complete the field training work.

Permission to write one or more supplemental examinations is at the discretion of the Revisions Committee and the Council of the School. Each case will

be considered on the student's yearly performance and academic average. Because of early registration, a student may be admitted conditionally to the second year of study pending the results of supplemental examinations written in the month of August or September. If the first year deficiencies are not cleared by October 1, a student may be asked to repeat the first year or to withdraw from the School.

Students seeking to repeat a failed year in the School of Dental Hygiene during the academic session immediately following the failure will be considered at the time of registration.

Students seeking to repeat a failed year after an absence of one academic session or more, will be considered at the Admissions Committee meeting for that academic session.

(4) PROGRAMS OF STUDY

(a) *Dental Auxiliary Program*

FIRST YEAR

Subject	Course No.	Hours
Public Speaking	Public Speaking 201	32
Introductory Sociology	Sociology 202	80
Dental Anatomy	Dental Hygiene 203	80
Psychology	Dental Hygiene 204	48
Dental Roentgenology	Dental Hygiene 205	16
English	English 210	80
Office Assistance and Administration	Dental Hygiene 211	64
Clinical Dental Hygiene	Dental Hygiene 212	256
Anatomy and Physiology	Dental Hygiene 213	128
Nutrition	Dental Hygiene 220	32
Food and Biochemistry	Biochemistry 221	80
Oral Histology and Embryology	Dental Hygiene 222	48
Dental Materials	Dental Hygiene 223	64
Physical Education		56
Total		1064

Field Training

First year Dental Auxiliary students have a two week orientation and field training period with the Provincial Department of Health and designated health units of Alberta. This field work will follow the examinations period in May.

SECOND YEAR

Subject	Course No.	Hours
Educational Foundations	Educational Foundations 301	96
Pathology	Dental Hygiene 302	48
Microbiology	Microbiology 304	80
Pharmacology	Dental Hygiene 305	32
Office Assistance and Administration	Dental Hygiene 311	64
Clinical Dental Hygiene	Dental Hygiene 312	272
Preventive Dentistry	Dental Hygiene 313	144
Dental Roentgenology	Dental Hygiene 315	64
Dental Health Education	Dental Hygiene 321	48
Dental Public Health	Dental Hygiene 322	32
Ethics and Jurisprudence	Dental Hygiene 323	16
First Aid and Safety Education	Dental Hygiene 324	32
Total		928

(b) *Dental Hygiene*

FIRST YEAR

Subject	Course No.	Hours
Public Speaking	Public Speaking 201	32
Introductory Sociology	Sociology 202	80
Dental Anatomy	Dental Hygiene 203	80
Psychology	Dental Hygiene 204	48
Dental Roentgenology	Dental Hygiene 205	16
English	English 210	80
Office Assistance and Administration	Dental Hygiene 211	64
Clinical Dental Hygiene	Dental Hygiene 212	256
Anatomy and Physiology	Dental Hygiene 213	128
Nutrition	Dental Hygiene 220	32
Food and Biochemistry	Biochemistry 221	80
Oral Histology and Embryology	Dental Hygiene 222	48
Dental Materials	Dental Hygiene 223	64
Physical Education		56
Total		1064

SECOND YEAR

Subject	Course No.	Hours
Educational Foundations	Educational Foundations 301	96
Pathology	Microbiology 304	80
Microbiology	Dental Hygiene 302	48
Pharmacology	Dental Hygiene 305	32
Office Assistance and Administration	Dental Hygiene 311	64
Clinical Dental Hygiene	Dental Hygiene 312	272
Preventive Dentistry	Dental Hygiene 313	144
Dental Roentgenology	Dental Hygiene 315	64
Dental Health Education	Dental Hygiene 321	48
Dental Public Health	Dental Hygiene 322	32
Ethics and Jurisprudence	Dental Hygiene 323	16
First Aid and Safety Education	Dental Hygiene 324	32
Total		928

(5) DETAILS OF COURSES

The University reserves the right to modify or withdraw any of the courses here outlined.

Students are reminded that regular attendance is expected in all courses.

NOTE: The hours of instruction per week for both terms of the winter session are shown at the top of each course description. The first figure in each term indicates lecture-hours and the second figure laboratory-hours. The letter "c" attached to a figure signifies clinic hours.

STAFF:—

Assistant Professors—Miss Margaret Berry, Director of the School; Miss Joan Conklin.

Instructors—Mrs. G. Fraser, Miss Judith Rask.

Sessional Lecturer—Mrs. Mary Bell.

Sessional Instructors—Mrs. B. Brown, Miss J. Haw.

Members of the Faculties of—Dentistry, Arts, Agriculture and Education and of the Department of Microbiology.

Pub S 201—Dean C. F. Bentley, Faculty of Agriculture (2-0; 0-0)

Public Speaking—A series of lectures on essentials and procedures in public speaking. The development of confidence before audiences by student participation in the preparation and presentation of short talks.

Soc 202 (3-0; 3-0)

Introductory Sociology—An introductory analysis of the nature of society, the interrelationships of its component groups, and the process whereby society persists and changes. Society is analyzed in terms of its structure, culture and social ranking schemes. The interrelationships between the various institutions (e.g. family, church, school, government) are considered. The processes are examined whereby the individual is socialized into society, as are the sources of conformist and non-conformist behavior.

D Hyg 203—Faculty of Dentistry (2-3; 0-0)

Dental Anatomy—A lecture and laboratory course designed to teach the student how to recognize, describe and reproduce tooth forms. The course will cover the structure, function and morphology of the teeth.

D Hyg 204—Mrs. R. Delehanty, Student Counselling Services (3-0; 0-0)

Psychology—An introduction to Psychology, its material and fundamental laws, application and relations to other sciences with particular reference to children—habit formation, emotions, thinking, individual differences, learning, adjustment and motivation.

D Hyg 205—Dean H. R. MacLean, Faculty of Dentistry (1-1c; 0-0)

Dental Roentgenology—A course in the fuudamental and elementary principles of dental roentgenology. The student will be required to spend time in the clinic learning the technical aspects of x-rays, i.e., the taking of, processing and mounting of x-rays.

Engl 210—Department of English, Faculty of Arts (3-0; 3-0)

English Language and Literature—A course designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

D Hyg 211—Miss M. Berry (2-0; 2-0)

Office Assistance and Administration—The course of study will continue throughout the two years of training and will relate theory and acquired knowledge from all phases of the Program. The procedures of patient contact and management, chair side assisting, general office administration, economics, bookkeeping and patient counselling will be considered.

D Hyg 212—Miss M. Berry and Associates (2-7; 0-7c)

Clinical Dental Hygiene—A lecture, pre-clinical and clinical course of training given throughout the two years. The course will cover the techniques of oral prophylaxis and patient education. The student will become familiar with the techniques of topical applications for the prevention of caries. The history and types of tooth brushes, tooth brushing methods and chair side instruction in proper oral hygiene will be studied.

D Hyg 213—Dr. G. H. Sperber, Faculty of Dentistry (2-2; 2-2)

Anatomy and Physiology—A lecture and laboratory course designed to provide a basic knowledge of anatomy and an understanding of the normal functions of the human body.

The following systems will be covered:—

circulatory, respiratory, digestive, reproductive, endocrine, skeletal, nervous, urinary and excretory. A more concentrated study will be made of the structures of the head and neck with special emphasis on the functions of the oral cavity, mastication, speech, swallowing, etc.

D Hyg 220—Mrs. K. Davidson, Faculty of Dentistry (0-0; 2-0)

Nutrition—A course of instruction in the general food requirements for growth, maintenance and repair of the body. Coverage of carbohydrates, fats, proteins, vitamins, minerals and water and their relation to dental health. Individual diet assessment and counselling and the application of this and nutrition factors in dental health education.

Bioch 221—Dr. J. M. deMan, Faculty of Agriculture (0-0; 2-3)

Food and Biochemistry—A lecture and laboratory course with an introductory review of inorganic and organic chemistry to facilitate the understanding of the basic biochemistry. Emphasis to be placed on food chemistry and its application in dentistry.

D Hyg 222—Faculty of Dentistry (0-0; 2-1)

Histology—Oral and Embryology—A lecture and laboratory course to provide a general knowledge of the elementary body tissues and structures. Particular emphasis will be placed on the development and structural characteristics of the head, face, oral cavity and teeth.

D Hyg 223—Dr. C. Duke, Dr. D. E. Marquis, Faculty of Dentistry (0-0; 1-3)

Dental Materials—A lecture and laboratory course to provide a general knowledge of materials (their properties, the preparation and manipulation) used in dentistry. The course will include impression compounds, gypsum and stone, inlay wax, investing and casting, alloys—gold and amalgam, cements.

Ed Fdn 301—Dr. K. H. Thmopson, Faculty of Education (3-3; 0-0)

Introduction to Education—A course designed to give the student a general knowledge of the history of education. The various influences that have shaped and changed educational beliefs and philosophy: political, economic, social and religious. Reference to the growth and development of education in Canada and in the Province. Observation and practical teaching experience.

D Hyg 302—Dr. K. A. McMurchy (2-1; 0-0)

Pathology—A lecture and laboratory course to introduce general pathology with consideration given to the more common diseases affecting the human body. Clinical pathology of the diseases affecting the teeth and their supporting structures including consideration of oral manifestations of selected systemic disturbances. A knowledge of visual differentiation between normal and abnormal tissues, the ability to recognize normal and abnormal occlusion. A knowledge of the physiological and pathological changes which affect the gingiva and the ability to recognize lesions of the hard and soft structures of the oral cavity.

Micro 304—Department of Microbiology (3-2; 0-0)

Microbiology—A lecture and demonstration course to give an understanding of the general principles involved in the study of micro-organisms with special emphasis on their application to the dental field. Consideration will be given to the classification and differentiation of microorganisms, methods of isolation, growth and identification. General principles of asepsis, antisepsis and antibiosis and immunity will be discussed. Reference will be made to the epidemiology of diseases and the precautionary measures used to prevent the transmission of communicable diseases.

D Hyg 305—Mrs. M. Bell (2-0; 0-0)

Pharmacology—A general knowledge of drugs by groups—uses, therapeutic action, dosage, etc. A knowledge of weights and measures and prescription writing. Special emphasis will be placed on the basic drugs used in dentistry, the physical and chemical properties and their effect on the human body. A knowledge of dental anaesthetics—topical, local, general, antibiotics, sterilizing

agents, astringents, emollients, antiseptics, basic anodynes, hemostatics, sedatives, stimulants, vasoconstrictors, dentifrices, dental adhesive products, detergents, mouth washes.

D Hyg 311—Miss M. Berry and Associates (1-0; 0-3)

Office Assistance and Administration—A continuation of the first year course, Office Assistance and Administration 211. The student will receive practical experience in assisting by working with the dental student on the clinic floor. The practical application of procedures for dental patient contact and management, administration, and patient counselling will also be received in the dental hygiene clinic.

D Hyg 312—Miss M. Berry and Associates (0-7c; 0-10c)

Clinical Dental Hygiene—A continuation of the first year dental hygiene course. The second year will be devoted to clinical experience. As opportunity presents, clinical experience will be gained in working with handicapped persons from Institutions and with school children under the Indian and Northern Health Services, Dental Division.

D Hyg 313—Members of the Faculty of Dentistry (2-0; 1-6)

Preventive Dentistry—Lecture, laboratory and clinical observation periods in the various divisions of the dental field. The preventive point of view will be stressed in operative and restorative dentistry, periodontics, orthodontics, pedodontics, oral diagnosis, oral surgery, hospital and home care, institutions and industry. The course will also include a series of 15 lectures and seminars in the pedodontic division to acquaint the students with the dynamic process of mental and physical growth of children in order that they can better understand behavior of children in the dental situation.

D Hyg 315—Dr. H. R. MacLean, Faculty of Dentistry (0-2; 0-2)

Dental Roentgenology—The fundamental and elementary principles of dental roentgenology were covered in the course "Dental Roentgenology 205". During the second year of training, the student wil lbe required to spend time in the clinic learning the technical aspects of x-rays, i.e., the taking, processing and mounting of x-rays.

D Hyg 321—Miss J. Conklin (0-0; 3-0)

Dental Health Education—A lecture course designed to give a basic knowledge of technique used in dental health education. The course will consider methods and available materials for dental health education, the preparation and presentation of dental health education, the preparation and presentation of dental health education for various age or interest groups in the school and community. The course will include the use of audio visual aids and it is expected that the student will have a working knowledge of a variety of these audio visual aids. The student will be expected to make critical reviews on various types of dental health education material available to the public as well as prepare papers on dental topics for class discussion.

D Hyg 322—Faculty of Dentistry (0-0; 2-0)

Dental Public Health—A lecture course outlining the historical and philosophical background of public health, traces the history of dentistry and details

the function of dentistry in public health services. The role of the dental health team is related to the concept of community dental health.

D Hyg 323—Miss M. Berry (0-0; 1-0)

Ethics and Jurisprudence—A lecture course designed to give the Dental Auxiliary and the Dental Hygienist a thorough understanding of her own profession and her relations to the profession and practice of dentistry. The course will include a study of ethics, jurisprudence and history of dentistry, dental hygiene and the dental auxiliary.

D Hyg 324—School of Dental Hygiene (0-0; 1-1)

First Aid and Safety Education—The course includes instruction and practice in the basic principles of first aid as established by St. John Ambulance Association. Safety education about the home, school and community with particular reference to the prevention of accidents that are injurious to the teeth and face will be covered.

XI

The Faculty of Dentistry

INFORMATION, REGULATIONS, COURSES

(1) (a) ACADEMIC STAFF OF THE FACULTY OF DENTISTRY

Professors Emeritus—H. E. Bulyea, W. S. Hamilton, S. D. Fraser.

Professors—R. V. Blackmore, A. D. Fee, R. D. Haryett, H. R. MacLean (Dean of the Faculty), K. A. McMurchy, J. Tuba.

Associate Professors—S. G. Geldart, G. H. Gibb, D. G. MacGregor, P. D. MacRae, R. C. McClelland, C. W. B. McPhail (Assistant to the Dean), M. W. Packer, W. J. Simpson, G. H. Sperber, D. R. Stewart, R. S. Van Alstine.

Assistant Professors—B. J. Eastwood, H. S. Flemming, M. D. Jones, O. N. Lucas, D. H. MacDougall, D. E. Marquis, R. P. Mullen, Z. M. Pawliuk, H. L. Samuels.

Lecturers—J. M. Calvert, R. B. Cameron, D. M. Collinson, Mrs. K. M. Davidson, G. A. Deane, R. E. Donnelly, C. E. Filipchuk, R. C. Hager, J. Hardy, L. Heppler, T. E. Jones, A. H. Lane, W. C. Meyer, B. M. Nowakowsky, F. L. Peterson, F. D. Read, A. E. Retzlaff, R. C. Sills, M. G. Strelioff, J. A. Theodore, A. C. Thompson, A. R. Urschel.

Sessional Lecturers—A. Borket, D. M. Buchanan, W. A. Buck, K. A. Burnham, R. L. Costigan, C. G. Duke, D. E. Florence, J. G. Geddes, P. G. Gotaas, C. L. Gullekson, S. S. Jucey, B. L. Kuzyk, J. G. Larson, V. M. Lloyd, R. S. Margolis, J. E. L. Mathieson, D. C. McKechnie, C. W. Olsen, S. W. P. Sapkos, J. M. Shields, J. Sikora, E. A. Stang, W. R. Stephens, W. R. Stuart, G. P. Wysocki, J. E. M. Young.

Honorary Members—J. W. Clay, C. H. Husband, H. B. Ness, W. A. Quigley.

(b) ACADEMIC STAFF OF THE SCHOOL OF DENTAL HYGIENE

Assistant Professors—Miss M. Berry (Director), Miss J. Conklin.

Instructors—Miss S. Amer, Mrs. G. Fraser, Miss J. Rask.

Sessional Lecturer—Mrs. M. Bell.

Sessional Instructors—Mrs. B. Brown, Mrs. J. Haw.

(2) INTRODUCTION AND GENERAL INFORMATION

Dental education was instituted at the University of Alberta in 1917 in the School of Dentistry under the Faculty of Medicine. The first full degree program was offered in 1923, and the first class graduated in 1927. The School became the Faculty of Dentistry in 1944. Dental Auxiliary training was instituted in 1961. In 1962 the School of Dental Hygiene came into being and now offers both the Dental Auxiliary and Dental Hygiene programs. A program of graduate studies was formally approved in 1962.

The Faculty (located in the Medical Sciences Building) offers a four year course of study leading to the degree of Doctor of Dental Surgery (D.D.S.), following satisfactory completion of at least *two* pre-professional years of university education. The pre-professional years provide the necessary background in inorganic chemistry, organic chemistry, zoology, physics, the humanities and social sciences.

In the dental curriculum, lecture and laboratory instruction in such fundamental subjects as Anatomy, Physiology, Bacteriology, Histology, Psychiatry, General Pathology, and Pharmacology, and in Medicine, Surgery and General Anaesthesia are offered by the respective departments of other Faculties. The dental sciences' lectures, laboratories, seminars and clinics relate and integrate these fundamental disciplines with the knowledge, skills, judgement and performance required of the dental practitioner.

In addition to bedside and operating instruction in medicine and surgery, the senior students are assigned to the Dental Department and the Departmet of General Anaesthesia at the University Hospital, which is located three blocks away. It has its dental staff, and dentistry is represented on the hospital advisory board. Thus the student is afforded an opportunity to relate his field of health services to the general field of science and art devoted to the prevention, cure or alleviation of disease.

The aims and purposes of the Faculty are:—

(a) to attract and select suitable and well qualified young men and women for dentistry;

(b) to provide the professional leadership, tuition, facilities and atmosphere which will encourage, stimulate and allow each student to develop his full potential in any chosen aspect of his future professional career, whether it be in private practice, a specialty, teaching or research;

(c) to graduate competent and well-trained dentists prepared for a role of leadership and service in their profession and in their community; and

(d) to provide the opportunity and stimulus for continued learning through short post-graduate, graduate and research programs.

Registration and Licensing for Practice

The Faculty is approved by the Council on Dental Education of the Canadian Dental Association and the American Dental Association.

Graduates in dentistry from the University of Alberta may register in the Province of Alberta upon payment of a licensing fee without further examination. (Those wishing to practise in any other province should secure from the dental registrar of that province all information respecting the practice of dentistry.) They are also eligible to write the examinations of the National Dental Examining Board of Canada, provided they have taken all their education in schools recognised by the Council on Dental Education, Canadian Dental Assocaition. They are also eligible to write licensing examinations in some of the states in the United States and the National Board Dental Examinations of the American Dental Association.

The Doctor of Dental Surgery (D.D.S.) degree and the Doctor of Dental Medicine (D.M.D.) degree (granted by some Canadian and United States universities) are equivalent degrees.

Graduate Study Program

The Faculty of Dentistry has research laboratories and instructional facilities for a limited number of graduate students proceeding to the M.Sc. degree.

Dental graduates may undertake graduate programs in either basic science or clinical science. Students without dental qualifications, but who hold a B.Sc. degree in biological or physical science are eligible for graduate work in the division of basic research in Dentistry. For additional information regarding graduate programs, please consult the calendar of the Faculty of Graduate Studies.

Inquiries should be directed to the Chairman, Committee on Graduate Studies, Faculty of Dentistry, University of Alberta, Edmonton, Alberta.

Continuing Education

Courses are offered by various Departments from time to time to provide a program of continuing education for the dental profession.

Library

A comprehensive selection of books and periodicals on dentistry and related subjects is contained in the Medical Sciences Reading Room of the Cameron Library.

In addition to the reference materials and textbooks on dentistry and related disciplines, the reading room contains over 138 current English and foreign language dental journals. A copy of the "Index to Dental Periodical Literature" is available to assist the librarian, students and the profession in locating information upon any subject. It is an index to all dental periodicals since 1839.

Student Guidance

Students in all years are assigned to faculty consultants, who will act as their special counsellors during their University course. These counsellors are appointed by the Dean of the Faculty.

Medical and Dental Exanimation

All students entering the University of Alberta for the first time are required to take a medical examination at the time of registration.

Students entering first-year dentistry are required to provide a certificate signed by themselves and a physician giving the details of their physical condition, and a certificate of dental fitness signed by a dentist.

Financial Assistance

Funds are available as loans or grants to undergraduate dental students as outlined in the Awards and Financial Assistance section of this calendar.

School of Dental Hygiene

The School of Dental Hygiene in the Faculty of Dentistry provides a two-year academic program of theoretical and professional training leading to a Diploma in Dental Hygiene. This program is approved by the Councils on Dental Education of the Canadian Dental Association and of the American Dental Association. Graduates are eligible to practise in any province of Canada, subject to the fulfillment of the requirements of the respective provincial licensing bodies.

Admission requirements for the School of Dental Hygiene are a High School Graduation Diploma (Senior Matriculation) with a "B" or higher standing in the required courses of Grade XII, and an average in these courses of at least 60% (or equivalent). The required courses are as follows: English 30, Social Studies 30, Chemistry 30, and *three* of Mathematics 30, Physics 30, Biology 30 (or 32 if taken before September, 1965), or a foreign language. It is strongly recommended that Biology 30 be taken by a prospective student.

Dental Auxiliary Program

The Government of the Province of Alberta offers a limited number of bursaries to students enrolled in the School of Dental Hygiene. The bursary consists of tuition fees, subsistence allowance of $75.00 a month during the academic years, and a book allowance of approximately $25.00. Bursaries are awarded primarily to residents of Alberta and on academic achievement. The bursary awards will be made after the completion of registration in the School of Dental Hygiene in the Fall. Students accepting the bursaries will be expected to be employed in local Health Units of Alberta for a two-year period following graduation, as a return of service for the financial assistance received.

Detailed information on the Dental Hygiene program or the Dental Auxiliary program may be obtained from the School of Dental Hygiene Calendar, or by writing to the Director, School of Dental Hygiene, Faculty of Dentistry, University of Alberta, Edmonton, Alberta.

(3) REQUIREMENTS FOR THE D.D.S. PROGRAM

1. Admission

(a) The basic requirement for admission to the Faculty of Dentistry is the satisfactory completion (after senior matriculation) of a least two years of university work approved by the Dental Faculty, including full university courses in organic chemistry, inorganic chemistry, physics and zoology (or biology).

Students are urged to take the program that they find most interesting, and that will still give them these prerequisites.

The requirements can be met in various degree patterns in different faculties.

For information, the Registrar should be consulted.

(b) **Aptitude Testing**

Prospective applicants from the *two-year* pre-professional program will be required to take the Dental Aptitude Testing Program (American Dental Association) as "with these tests it is possible to predict, with a high degree of accuracy, the probable success of students in dental schools". Details should be obtained by writing to the Dean, Faculty of Dentistry, University of Alberta, Edmonton.

(c) All students wishing to enter *the first professional year of dentistry are required to make application on or before May 15. Residents outside Canada must make application on or before April 15.* A student proceeding towards a first degree will normally be required to attend at least one academic year as a full-time student. In general, consideration for admission to the

limit of available accommodation will be given to those students with an average of at least 65% (or equivalent) in all courses taken after senior matriculation.

(d) Enrolment in any faculty or school must necessarily be limited to the number of students who can be accommodated. Students are normally accepted in the order of their academic standing from among the whole list of applicants.

(e) **While admission to dentistry is based largely on academic standards, it must be distinctly understood that no student can be guaranteed admission to dentistry on the basis of academic standing alone. Before final acceptance any applicant may be required to satisfy representatives of the faculty at a personal interview. The possession of personal qualities necessary for successful practice will be stressed. Further, any student whose performance in the work of any professional years is unsatisfactory to the faculty will not be permitted to continue in the study of dentistry.**

(f) In the matter of admission to the first year in Dentistry each applicant, when notified that his application has been accepted, shall within a period of fifteen days of the date of notification, *make a deposit in the sum of fifty dollars* with the Bursar, University of Alberta, Edmonton, which amount will be later (a) applied on his fees if he registers, or (b) refunded in full if the applicant is unable to register and notifies the Registrar of this fact not later than July 15th of the year of application, or (c) forfeited in full if the applicant fails to register or neglects to notify the Registrar of his change of intention on or before July 15th.

2. PROMOTION

(a) Dentistry is on a year system; except in special circumstances students must complete each year before being promoted.

(b) Students in the Faculty of Dentistry are required to obtain a mark of 50% (or equivalent) in each written paper and a weighted average of 60% (or equivalent) in all written papers.

(c) Students will be permitted to repeat first year dentistry only in exceptional cases as determined by the Council of the Faculty of Dentistry and on the understanding that the requirement for promotion to second year for repeating students will be a weighted average of 65% (or equivalent).

(d) A student permitted to repeat a failed year, who does not produce a satisfactory record in his first term examinations in the repeated year, will be required to withdraw from the Faculty and will be denied further registration in the Faculty.

(e) Supplemental Examinations. A student who has failed any course in the preceding session and who has been granted a supplemental examination may apply to the Registrar not later than the specified date for permission to write it.

(f) All students entering the junior and senior years of dentistry are required, by provincial legislation, to be registered on the Educational Register of the Alberta Dental Association. This registration permits the practice of dentistry within the confines of the formal dental curriculum.

3. Approximate Cost of Books and Instruments (Approximate Figures)

(a) *Textbooks*:

First year	$150.00
Second year	155.00
Third year	160.00
Fourth year	30.00

(b) *Instruments and Supplies*:

First year	$315.00
Second year	625.00
Third year	460.00
Fourth year	285.00

Students should budget for additional supplies which they are required to purchase from time to time.

Students are not compelled to purchase books or instruments from sources indicated, but they must comply as to quality, and in the case of books—latest editions.

4. Registration and Fees

For schedule of fees and general information see Part I of this calendar.

5. Course Curriculum

FIRST YEAR

Subjects	Course No.	Hours of Instruction Per Week
Anatomy—		
General and Neuroanatomy	Anat. 412	3-4; 3-4
Microscopic	Anat. 417	2-4; 0-0
Biochemistry	Biochem. 412	3-3; 3-3
Physiology	Physiol. 451	4-0; 4-0
Orientation, History and Ethics	Dent. 411	1-0; 0-0
Oral Anatomy	Dent. 413	2-6; 1-3
Community Dental Health	Dent. 414	0-0; 1-0
Oral Embryology and Histology	Dent. 417	0-0; 2-4
Dental Materials	Dent. 419	1-0; 1-0

SECOND YEAR

Subjects	Course No.	Hours of Instruction Per Week
Anthropology	D. Anat. 421	0-0; 1-0
Bacteriology	Bact. 422	3-3; 1-3
General Pathology	Path. 422	4-2; 0-0
Pharmacology	Pharm. 470	2-3; 0-0
Psychodynamics	Psychiatry 420	0-0; 1-0
Full Denture Prosthesis	Dent. 420	2-6; 1-3
Removable Part. Dent. Prosth.	Dent. 421	0-0; 1-3
Fixed Partial Denture	Dent. 422	0-0; 1-3
Operative Dentistry	Dent. 423	1-6; 1-3
Oral Pathology	Dent. 424	0-0; 1-2
Pedodontics	Dent. 425	1-0; 0-0
Oral Diagnosis	Dent. 426	1-0; 1-0
Periodontics, Introductory	Dent. 427	0-0; 1-0
Local Anaesthesia	Dent. 428	1-0; 0-0
Orthodontics	Dent. 430	0-0; 1-0
Nutrition and Clinical Biochemistry	Dent. 431	0-0; 1-0
Oral Physiology	Dent. 432	0-0; 1-0

THIRD YEAR

Subjects	Course No.	Hours of Instruction Per Week
Medicine	Med. 434	0-0; 1-0
Surgery	Surg. 434	0-0; 1-0
Full Denture Prosthesis	Dent. 440	1-6c; 1-6c
Preventive & Community Dentistry	Dent. 441	0-0; 1-0
Fixed Part. Dent. Prosthesis	Dent. 442	1-6; 0-3c
Operative Dentistry	Dent. 443	1-6c; 1-8c
Endodontics	Dent. 444	1-2; 0-1c
Pedodontics	Dent. 445	1-2; 1-3c
Oral Diagnosis and Pathology	Dent. 446	1-0; 1-0
Periodontics, Intermediate	Dent. 447	1-3c; 1-3c
Oral Surgery	Dent. 448	1-0; 1-0
Orthodontics	Dent. 450	1-2; 1-2

FOURTH YEAR

Subjects	Course No.	Hours of Instruction Per Week
General Anaesthesia	Med. 443	0-0; 1-0
Denture Prosthesis	Dent. 460	1-6c; 1-6c
Fixed Part. Dent. Prosth.	Dent. 462	1-4c; 0-5c
Operative Dentistry	Dent. 463	1s-7c; 1s-8c
Endodontics	Dent. 464	0-1c; 0-1c
Pedodontics	Dent. 465	1s-3c; 1s-3c
Pathology Diagnosis Seminar	Dent. 466	1s-3c; 1s-3c
Periodontics, Advanced	Dent. 467	2-3c; 2-3c
Oral Surgery	Dent. 468	1-3c; 1-3c
Orthodontics	Dent. 470	1s-3c; 1s-3c
Ethics and Jurisprudence	Dent. 471	0-0; 1-0
Practice Management	Dent. 472	1-0; 0-0

6. Details of Courses

Regular attendance is expected of students in all courses.

Note: The hours of instruction for both terms of the winter session are shown at the top of each course description. The letter "c" attached to a figure signifies clinic-hours and the letter "s" seminar-hours. Otherwise, the first figure in each term indicates lecture-hours and the second laboratory-hours.

ANATOMY

Anat 412.—Anatomy Staff (3-4; 3-4)

General Anatomy and Neuroanatomy—Gross anatomy of the body in general and of the head and neck in detail; the structure of the human nervous system.

Textbooks: *Manual of Dissection;* Lockhart, Hamilton, Fyfe, *Anatomy of the Human Body.*

Anat 417.—Anatomy Staff (2-4; 0-0)

Microscopic Anatomy—The minute anatomy and development of the tissues and organs of the human body with special attention to the teeth and related oral structures.

Textbook: Ham and Leeson, or Bloom, *Histology.*

Dent 417.—L. Heppler and Associates (0-0; 2-4)

Oral Embryology and Histology—A lecture and microscopic laboratory course dealing with the embryology of the face and oral cavity, the development and minute anatomy of the teeth and their supporting structures, the salivary glands, and the upper digestive tract.

Anat 421.—R. F. Shaner (0-0; 1-0)

Anatomy (Anthropology)—A brief survey of ancient man, and of the anatomical evidence for man's place in nature.

Prerequisite: Anatomy 411 or 412.

BACTERIOLOGY

Bact 422.—R. V. Blackmore and members of the Department of Bacteriology (3-3; 1-3)

Bacteriology—For students in the second year in Dentistry. During the first term the course deals with general bacterioiogy illustrating the fundamental aspects of infection and resistance. In the second term the special bacteriology of the mouth is considered in relation to dental caries and periodontal disease. Exercises in bacteriological technique are given in laboratory periods.

Textbook: Burnett and Scherp, *Oral Microbiology and Infectious Disease.*

BIOCHEMISTRY

Bioch 412.—J. Tuba (3-3; 3-3)

General Course—The lectures and laboratories are designed to give students in first-year dentistry an appreciation of general biochemical concepts in relation to metabolism. In addition, consideration is given to metabolism in certain disease states.

Textbooks: Clark, *Experimental Biochemistry;* White, Handler and Smith *Principles of Biochemistry,* 3rd Edition

Prerequisites: Chemistry 230 and Chemistry 250.

Dent 431.—J. Tuba and Associates (0-0; 1-0)

Nutrition and Clinical Biochemistry—Lectures dealing with basics of nutrition and diets and their practical applications in dentistry. Also selected topics, e.g., calcium and inorganic phosphate metabolism, including mineralization mechanisms and disturbances; enzymes in the gastrointestinal tract, blood, and tissues, in relation to the health of the whole body and of oral tissues.

Prerequisite: Biochemistry 412.

COMMUNITY DENTAL HEALTH

Dent 411.—C. W. B. McPhail and Asscociates (1-0; 0-0)

Orientation, History and Ethics—This course introduces the student to the profession of dentistry in relation to curriculum content, undergraduate requirements, history of the profession, and the development of ethical concepts and their application.

Selected references.

Dent 414.—C. W. B. McPhail and Associates (0-0; 1-0)

Dental Public Health and Community Dentistry—This course introduces the concept of community dental health with major emphasis on the role of dentistry in public services. It includes a brief introduction to the historical and

philosophical background of public health and the development, growth and current status of principles, legislation and practices related to dental public health.

Selected references.

Textbook: Young and Striffler, *The Dentist, His Practice and His Community.*

Dent 441.—C. W. B. McPhail and Associates (0-0; 1-0)

Preventive and Community Dentistry—This course expands the concepts of community dental health with major emphasis on the role of dentistry in private practice and in the community. It stresses a comprehensive approach to the dental health problem including the following aspects: biometrics as applied in dentistry, prevention and control of dental diseases, auxiliary personnel and recent legislation.

Selected references.

DENTAL PROSTHESIS

Dent 419.—C. G. Duke and Associates (1-0; 1-0)

Dental Materials—A course of lectures on the various materials used in dental practice.. The purpose of this course is to familiarize the student with the properties of all accepted materials.

Textbooks: Skinner, *Science of Dental Materials;* Dorland, *Medical Dictionary.*

Dent 420.—A. D. Fee and R. C. McClelland (2-6; 1-3)

Full Denture Prosthesis—A course of lectures, demonstrations and laboratory procedures in the construction of artificial full dentures. The lectures relate the material learned in Anatomy 412, Anatomy 416 and Physiology 451 to the principles of full denture construction.

Textbook: *Swenson's Complete Dentures,* 5th Edition.

Dent 421.—R. C. McClelland and Associates (0-0; 1-3)

Removable Partial Denture Prosthesis—Lecture and laboratory instruction in the classification and design of the various types of removable partial dentures. Emphasis is placed upon the relationship of this type of treatment to operative and periodontal services in restoring the dentition to maximum health and function.

Textbook: Applegate, *Removable Partial Dentures.*

Dent 440.—A. D. Fee and Associates (1-6c; 1-6c)

Full Denture Prosthesis—A continuation of Dentistry 420 with an introduction to clinical practice.

Dent 460.—A. D. Fee and Associates (1-6c; 1-6c)

Denture Prosthesis—A continuation of Dentistry 440 and Dentistry 421 conforming to the advanced work of the final year, with application to clinical practice.

ENDODONTICS

Dent 444.—J. M. Calvert and D. M. Collinson (1-2; 0-1c)

Endodontics—A lecture, laboratory and clinical course on the conservation of pulp-involved and pulpless teeth. Procedures for diagnosis and treatment

are described, demonstrated and correlated with the related dental and basic sciences. Laboratory practice is carried out on manikins under simulated clinical conditions. The second term consists of an introduction to clinical procedures with treatment carried out on selected patients.

Textbook: Sommer, Ostrander and Crowley, *Clinical Endodontics,* 3rd Ed.

Dent 464.—D. M. Collinson and Associates (0-1c; 0-1c)

Endodontics—A continuation of Dentistry 444 with application to clinical practice. Endodontic treatment is carried out on selected patients.

Textbook: Sommer, Ostrander and Crowley, *Clinical Endodontics,* 3rd Ed.

ETHICS AND JURISPRUDENCE

Dent 471.—C. W. B. McPhail and Associates (0-0; 1-0)

Ethics and Jurisprudence—This course deals with the moral and legal aspects of the practice of dentistry. The legal factors are presented and discussed by members of the Faculty of Law.

MEDICINE

Med 434.—D. R. Wilson and Associates (0-0; 1-0)

Medicine—The general aspects of medicine are dealt with, with particular reference to local and systemic diseases of dental interest.

For students in third-year dentistry.

Textbook: Comroe, Collins and Crane, *Internal Medicine and Dental Practice.*

Med 443.—E. A. Gain and Associates (0-0; 1-0)

General Anaesthesia—This is a course for dental students, with particular reference to general anaesthesia. It will comprise, besides lectures and instruction on the general technique of giving various anaesthetics, a course designed to give the student a working knowledge of the preliminary and after-care of patients and of conditions unfavorable for general anaesthesia.

ORAL DIAGNOSIS

Dent 426.—D. G. MacGregor and Associates (1-0; 1-0)

Oral Diagnosis and Treatment Planning—Diagnostic procedures and their application. The review of normal oral tissues, growth, age changes. The fundamental and elementary principles of dental roentgenology.

Textbooks: McColl and Wald, *Oral Roentgenology;* Kerr, Ash, Millard, *Oral Diagnosis,* 2nd Edition.

References: Ennis and Berry, *Dental Roentgenology;* Wuehmann & Manson-Hing, *Dental Radiology.*

Dent.446.—D. G. MacGregor and K. A. McMurchy (1-0; 1-0)

Oral Diagnosis and Pathology—Special problems in diagnosis, pathology and treatment planning of less common oral lesions and abnormalities.

Textbooks: Burket, *Oral Medicine, Diagnosis and Treatment;* Stafne, *Oral Roentgenographic Diagnosis.*

Dent 466.—D. G. MacGregor and K. A. McMurchy (1s-3c; 1s-3c)

Pathology Diagnosis Seminar—Case presentations by the diagnostic and pathology staff. Each student is required to spend not less than one week in the Diagnostic Clinic.

ORAL SURGERY

Dent 428.—R. S. Van Alstine (1-0; 0-0)

Local Anaesthesia—Lectures and demonstrations on the administration of local anaesthetics.

Textbook: *Archer, Practical Anaesthesia.*

Dent 448.—R. S. Van Alstine (1-0; 1-0)

Oral Surgery—A course of lectures on the diagnosis and treatment of the various conditions of the mouth requiring surgical care, including removal of teeth.

Textbook: Archer, *Oral Surgery.*

Dent. 468.—R. S. Van Alstine and Associates (1-3c; 1-3c)

Oral Surgery—Clinical instruction and demonstrations of exodontia and minor oral surgical procedures under both local and general anaesthesia. Students assist in and observe oral surgery procedures performed in the University Hospital (and other city hospitals when possible).

PATHOLOGY

Path 422.—J. W. Macgregor (4-2; 0-0)

General Pathology—A series of lectures in general pathology extending over a period of twenty-two weeks. Laboratory instruction in pathologic histology.

Textbooks and References: As cited by instructor.

Dent 424.—K. A. McMurchy (0-0; 1-2)

Oral Pathology—A lecture and laboratory course dealing with the pathological study of teeth, their surrounding structures, the mucous membrane, bone and other tissues.

Textbook: Shafer, Hine, Levy, *Oral Pathology,* 1958 Ed.

PEDIATRIC DENTISTRY

Orthodontic Division

Dent 430.—R. D. Haryett and Associates (0-0; 1-0)

Orthodontics—A course of lectures concerned with the growth and development of the dento-facial complex.

Embryology of the face and jaws is also discussed.

Textbook: Moyers, *Handbook of Orthodontics.*

Reference books will be assigned in class.

Dent 450.—R. D. Haryett and Associates (1-2; 1-2)

Orthodontics—A course of lectures designed to acquaint the dental student with the etiology, classification, diagnosis, prevention and interception of malocclusions.

Laboratory instruction is given in impression, model and soldering techniques and the construction of appliances designed for cases requiring simple treatment.

Textbook: Same as for Dent. 430.

Dent 470.—R. D. Haryett and Associates (1s-3c; 1s-3c)

Orthodontics—This course consists of seminars, clinical demonstrations, and clinical training. Each student presents two seminars. In the one, the student

presents an essay on an assigned clinical topic; in the other, the student presents an example of an actual clinical problem which is discussed under the headings of diagnosis, etiology, treatment and prognosis.

Clinical demonstrations are given on selected clinical problems such as band placement, occlusal adjustment in the primary dentition, etc.

Clinical training involves preventive, interceptive, and simple treatment of orthodontic problems of particular concern to the general practitioner. The clinical training is designed to enable the student to apply knowledge acquired in the lectures and laboratory.

Pedodontic Division

Dent 425.—W. J. Simpson and Associates (1-0; 0-0)

Pedodontics—Mental and physical growth and development of the pre-school child.

Textbook: Gesell, *First Five Years of Life.*

References: Valentine, *The Normal Child;* Hall, *A Primer of Freudian Psychology.*

Dent 445.—W. J. Simpson and Associates (1-2; 1-3c)

Pedodontics—Physical growth and development in the 6-16 year age group. Restorative and preventive procedures in pre-school and school age children.

Textbook: Finn, *Clinical Pedodontics.*

References: Cohen, *Pediatric Dentistry; McDonald, Pedodontics.*

Dent 465.—W. J. Simpson and Associates (1s-3c; 1s-3c)

Pedodontics—Case analysis and treatment planning; pedodontics in a general practice, dental care for handicapped children, including restorative treatment under general anaesthesia in a hospital.

Textbook: Finn, *Clinical Pedodontics.*

References: Cohen, *Pediatric Dentistry;* McDonald, *Pedodontics.*

DEPARTMENT OF PERIODONTOLOGY

Dent 427.—M. W. Packer and Staff (0-0; 1-0)

Introduction to Periodontics—A course designed for instruction in elementary principles of periodontal disease. Lectures will acquaint the students with the relationships between histology, anatomy, bacteriology, physiology, pathology, pharmacology, biochemistry and the field of periodontology. Emphasis is placed on correlating the basic science courses with the clinical courses which the student will take in third and fourth years.

Dent 447.—M. W. Packer and Staff (1-3c; 1-3c)

Intermediate Periodontics—A course of study that involves both clinical and application to periodontology. The student is introduced to clinical application of his previous learning and has an opportunity of relating basic science courses to periodontal therapy. The student becomes familiar with the basic instrumentation procedures, periodontal examination and case management of periodontal diseases.

Dent 467.—M. W. Packer and Staff (2-3c; 2-3c)

Advanced Periodontics—During the fourth year the student will have an opportunity to become familiar with all of the techniques now in general use

in periodontal therapy. He will also have the opportunity to handle cases on a more individual basis and deal with cases that he is interested in. Correlation between clinical periodontics and histopathology of the periodontium will be stressed.

PHARMACOLOGY

Pmcol 470—E. E. Daniel, G. B. Frank, G. S. Marks, W. A. Mahon, D. P. MacLeod, C. W. Nash, R. J. Reiffenstein, J. D. Taylor and Staff (2-3; 0-0)

Pharmacology (Second Year)—A course on the pharmacological actions of drugs selected for their physiological and clinical significance. The course involves a study of basic pharmacological principles as applied to representative drugs having their primary actions on various organ systems of the body. Classes of drugs studied include general and local anaesthetics; hypnotics, sedatives and anticonvulsants; analgesics; central nervous system stimulants; autonomic and curariform drugs; histamine and antihistaminics; chemotherapeutic agents. Instruction is given in the form of lectures, demonstrations, laboratory exercises. Written and oral reports, based on laboratory work, are required of each student.

Textbooks: Goth, *Medical Pharmacology,* 2nd Edition; Goodman and Gilman, *The Pharmacological Basis of Therapeutics,* 3rd Edition.

PHYSIOLOGY

Physl 451.—O. N. Lucas and Staff, Department of Physiology (4-0; 4-3)

Physiology (First Year)—The course consists of two parts. The first, largely given in the first term, comprises a study of basic physiology of cells and tissues, of the circulatory, digestive and respiratory systems, and of the phenomena of digestion, absorption, metabolism and excretion. The second part comprises the physiology of nerves and synapses, muscle, spinal reflexes, brain centres and tracts, the autonomic nervous system and also includes endocrinology and reproduction.

The course content is presented in lectures, demonstrations, and laboratory exercises.

The lecture course is the same as Physiology 411; the laboratory classes are given separately.

Textbooks: Bell, Davidson and Scarborough, *Textbook of Physiology and Biochemistry,* 5th ed.; Bard, *Medical Physiology,* 11th ed.; Samson, Wright, *Applied Physiology,* 11th Ed.

Dent 432—Dr. O. N. Lucas and Associates (0-0; 1-0)

Oral Physiology—This course consists of 15 lectures and covers a detailed explanation of the physiological functions of the oral structures. Special consideration is given to the dynamics of mastication, kinesiology of the masticatory muscle, temporamandibular joint, occlusion, deglutation etc. Physiology of the cranial nerves with special emphasis on the trigeminal and facial nerves as well as salivary glands and composition of the saliva are covered.

PRACTICE MANAGEMENT

Dent 472—S. G. Geldart and Associates (1-0; 0-0)

Practice Management—This course deals with office procedures and administration based on the effective integration of auxiliary services.

Textbook: Stinaff, *Dental Practice Administration.*

PSYCHIATRY

Psyci 420.—K. A. Yonge and Staff (0-0; 1-0)

Psychodynamics and Dentistry—This course deals with essentials of psychodynamics as relevant to the practice of dentistry. It includes discussion of the development of sensation and perception, the signifiancce and effect of anxiety, normal personality types and their extremes, and methods applicable to the dentist for dealing with patients psychotherapeutically.

RESTORATIVE DENTISTRY

Dent 413.—G. H. Gibb and Associates (2-6; 1-3)

Oral Anatomy and Introduction to Restorative Dentistry—A course dealing with the nomenclature, morphology and chronology of the development of the teeth; the internal and external anatomy of the teeth and their occlusion, with clinical application. Time is spent in the latter half preparing cavities in stone, and natural teeth and dentoform, preparatory to Dentistry 423.

Textbook: Wheeler, *Dental Anatomy and Physiology.*

Dent 423.—G. H. Gibb and Associates (1-6; 1-3)

Operative Dentistry—This course is designed to acquaint the student with the principles and procedures necessary to successful clinical practice. Technical procedures in this course include preparing cavities in artificial and natural teeth and placing restorations of gold foil, gold inlays and amalgam in the prepared cavity. Manikins are used, rubber dams placed and orderly procedure is mandatory. Where timetabling does not interfere the more advanced students will spend some time in the clinic. The student is responsible for supplying suitable natural teeth.

Textbook: Black, *Operative Dentistry,* Vol. II, 9th Edition—Blackwell.

Dent 443.—G. H. Gibb and Associates (1-6c; 1-8c)

Operative Dentistry—The lecture course is a continuation of Dent. 423 meant to emphasize the application of basic principles to clinical practice. The horizon of operative technics is broadened by relating it to the dystrophies, abraisons and erosion. The lecture course is supplemented by a weekly demonstration period.

Clinically the student is introduced to operating in the infirmary. Work is done on patients in gold foil, gold inlay and amalgam.

Cleanliness, deportment and orderliness of procedure are emphasized.

Textbook: McGehee, True, Inskipp, *Operative Dentistry.*

Dent 463.—G. H. Gibb and Associates (1s-7c; 1s-8c)

Operative Dentistry—Weekly demonstrations supplemented by student clinics, calling for the preparation of papers, slides and models, in phases of the subject not covered in the regular course, serve to broaden the field preparatory to graduation. Clinically the work is a continuation of Dent. 443, including an introduction to the use of porcelain, silicates and cements.

Textbook: Simon, *Clinical Operative Dentistry.*

Dent 422.—D. R. Stewart and Associates (0-0; 1-3)

Fixed Partial Denture—Lectures, demonstrations and laboratory instruction on the basic principles in the construction of and in the preparation of abutment teeth for the reception of retainers, piers, pontics and connectors for a fixed partial denture. Manikins are used on which a simple bridge is constructed.

Dent 442.—D. R. Stewart and Associates (1-6; 0-3c)

Fixed Partial Denture—A continuation of Dent. 422 lectures and laboratory exercises during the first half. Lectures include handling of the various materials used and engineering principles involved in fixed partial denture construction. Instruction is also given in the fabrication of a porcelain jacket crown.

The second half is devoted to the clinical application of these principles.

Dent 462.—D. R. Stewart and Associates (1-4c; 0-5c)

Fixed Partial Denture—A continuation of Dentistry 442 lectures and clinical experience.

SURGERY

Surg 434.—R. A. Macbeth and Associates (0-0; 1-0)

Surgery—For students in the third year in Dentistry. A course of lectures covering the general principles of surgery.

CLINICAL DENTISTRY

Students of the two final years are required to carry to completion a specified amount of treatment on patients in the various branches of dentistry.

Third-year students are assigned to the diagnostic clinic for specified periods in rotation.

Final-year students are assigned to the diagnostic clinic on full time for periods of a week in rotation. The schedule will appear on the bulletin board.

Final-year students receive instruction at the University Hospital in general anaesthesia, medicine, surgery and restorative dentistry.

GRADUATE COURSES

Dent 500. (1-3; 1-3)

Cephalometrics—Prerequisite: Permission of the Department.

Dent 501. (1-6; 1-6)

Advanced Pedodontics—Prerequisite: Permission of the Department.

Dent 502.—K. A. McMurchy and Staff (0-0; 1-2)

Advanced Oral Pathology—A lecture and laboratory course dealing with techniques for obtaining and preserving specimens for pathological examination, the interpretation of pathological reports, and the pathology of some of the rarer oral lesions.

Dent 503.—Members of the basic science division,
Faculty of Dentistry (3-0; 0-0)

Mineralization in Biological Systems—A lecture course dealing with the developmental morphology and the chemical nature of the protein and mineral phases of calcified tissues in man and animals. Particular emphasis will be given to calcification and decalcification of teeth and bones.

XII

The Faculty of Education

INTRODUCTION

The Faculty of Education is organized for the professional education of teachers for elementary, junior high and senior high school grades, and for graduate study and research in the field of Education.

In this calendar appear the courses of study administered by the Faculty of Education together with regulations governing these programs. General regulations applicable to all faculties of the University are to be found in Part I of the Calendar.

The calendar also contains requirements for certificates issued by the Provincial Department of Education on the recommendation of the Faculty of Education. Such certificates are granted under authority of the Minister of Education.

Address inquiries to: Dean, Faculty of Education, University of Alberta.

(1) **Board of Teacher Education and Certification**

A Board of Teacher Education and Certification representing jointly the Department of Education, the University of Alberta, the Alberta Teachers' Association and the Alberta School Trustees' Association serves as a liaison body for the groups it represents. This board is purely an advisory body. It is authorized to make recommendations to the Minister of Education and to the President of the University respecting the programs of instruction, the estimates of expenditures on these programs, appointments to the staff of the Faculty of Education, and regulations governing the certification of teachers.

(2) **Programs (General Statement)**

Entrance or matriculation requirements are specified on the next page.

The programs are described under Details of Programs. There are two general programs, one for elementary school teaching and one for secondary school teaching. Both provide for considerable specialization either in the usual academic subjects or in certain special subjects.

In addition there are highly specialized programs for teachers of industrial arts and vocational education.

All programs provide for certification by the Alberta Department of Education on the completion of two years of teacher education, higher certification at the end of three years, and the Bachelor of Education degree at the end of four years.

To suitable candidates the faculty offers graduate courses leading to the M.Ed., Ed.D. and Ph.D. degrees.

ADMISSION

(1) **Matriculation Requirements**

Matriculants from the high schools of Alberta seeking admission to the Faculty of Education in September, 1966 must possess:

(a) a High School Graduation Diploma with

(b) "B" (50%) or higher standing in each of the courses of Grade XII as set forth below, and

(c) an average in these courses of at least 60%;

1. English 30,
2. Social Studies 30,
3, 4, 5, 6. Four of: French 30, German 30, Latin 30, Ukrainian 30, Chemistry 30, Physics 30, Biology 30 (or 32 if taken before Sept. 1966), Mathematics 30, Mathematics 31, Music 30.

NOTES:

1. Candidates intending to major in biological sciences or household economics should present Chemistry 30 or equivalent.
2. Candidates intending to major in physical sciences should present Chemistry 30, Physics 30, and Mathematics 30 or equivalents.
3. Candidates intending to major in mathematics should present Mathematics 31 in addition to Mathematics 30.
4. Mathematics 31 to be accepted when presented after June, 1962, on the basis of a Grade XII Departmental examination.
5. Adult applicants (age 20 or over) will not be required to present a high school diploma, but (b) and (c) above still apply.

These general regulations notwithstanding, the University may, at its discretion, refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements at the University of Alberta.

(2) **Admission with Advanced Standing or Advanced Credits**

Applicants presenting transcripts from normal schools, teachers' colleges, or universities other than the University of Alberta at Edmonton, will have such transcripts evaluated by the *Committee on Admissions*. The transcripts should be submitted to the Registrar, University of Alberta, Edmonton. A *VISE* fee of *FIVE* dollars is charged for evaluating documents issued in other provinces in Canada and *TEN* dollars for evaluating documents issued in other countries.

(3) **Extramural Credits**

(a) Credit to a maximum of four *junior* courses taken extramurally from another recognized university will be allowed, although the actual number will vary with the program.

(b) Students who expect to receive credit on their University of Alberta program in the Faculty of Education for subjects studied extramurally from other institutions must get permission in writing from the Dean's Office to take a particular subject for credit.

(4) Application for Admission

Application forms may be obtained from the office of the Dean of the Faculty of Education or from the Registrar of the University. Each student applying for the first time for admission to the Faculty of Education should write the Examinations Branch, Department of Education, Edmonton, requesting that a transcript of his high school record be forwarded to the Registrar of the University at Edmonton. When writing for a transcript he should give his name in full, the year in which his last departmental examinations were written and the grade level of these examinations. He should enclose the fee of $2.00 charged for this service.

Students from outside the province will write to the Registrar of the Provincial Department of Education in the province where senior matriculation was obtained.

Credits obtained in the June examinations of 1966 should be submitted as soon as results are available.

No definite and final ruling concerning registration can be obtained until all certificates and transcripts of standing have been reviewed by the Committee on Admissions. The Faculty of Education gladly consults with and advises students regarding programs of study, but all decisions are *unofficial* and *tentative* until documents have been received and evaluated by the Committee on Admissions.

REGISTRATION

(1) Registration and Pre-Registration Procedures

Applicants for admission must—

(a) furnish evidence by means of a transcript of credit record from a Department of Education or other educational authority that they meet matriculation requirements;

(b) complete, in duplicate, *Application for Admission* forms obtainable from the Registrar.

(2) Registration Details

(a) Change of Registration;

The accuracy of his registration forms is the responsibility of each student. Changes in registration may be allowed on application to the Faculty of Education office on or before October 5.

(b) Registration in Physical Education:

General University regulations require all first-year students to obtain credit in physical education.

GENERAL INFORMATION

(1) **Education Undergraduate Society**

The Education Undergraduate Society (E.U.S.) is a professional organization and a branch of the Alberta Teachers' Association (A.T.A.). It is expected that all Education students will:

(a) join the Society,

(b) participate in its social activities, and

(c) actively promote its professional interests.

(2) **Transfer from One Program to Another**

In general, a student may transfer from one training program to another at any point in the four-year program, provided he obtains credit in subjects of the program which were not included in the former one.

(3) **Examinations**

Finals

Final examinations are held at the end of each winter, summer or special session. The pass mark in all subjects of both degree and certification programs is at stanine 4.0 level.

Supplementals

(a) There is no supplemental privilege in student teaching.

(b) Teachers who, during the regular Supplemental Examination period, are in teaching positions may, with approval, write the supplemental examination at the end of the Summer Session. If an examination in the required subject is on the regular schedule, the fee for the supplemental is $10.00. If a special examination paper must be prepared, the fee is $15.00.

(c) Students who *fail* courses in the Summer Session will not be granted supplementals.

(4) **Regulations Governing Certification**

For detailed regulations governing certification of teachers, students should write the Registrar, Department of Education, Administration Building, Edmonton. A pamphlet is available on request.

(5) **Advance Credits for Certified Teachers**

One year's credit in the four-year program is given for one year of basic teacher education.

(6) A student whose B.Ed. program has been inactive for three years or who has failed to complete the degree in fifteen years may have his program reviewed and, if necessary, rearranged.

Allowance for credit from Department of Education Summer Sessions was withdrawn effective September 1, 1965.

(7) Special Second-Year Program for Certificated Teachers

Certificated teachers will for their second year be entered upon a special program consisting almost exclusively of Arts and Science courses. See DETAILS OF PROGRAMS—C and E.

(8) Evening Credit Program

Students contemplating registration in Evening Credit courses must register on or before August 31, the last day for registration in the Evening Credit Program.

CERTIFICATION

Alberta teaching certificates are issued only by the Department of Education, Government of Alberta. All inquiries concerning certification should be addressed to the Registrar, Department of Education, Edmonton.

The certificates mentioned in the following pages are authorized under Order-in-Council 728 (1954) of the Government of Alberta.

A. (General Certificates)

Types of Certificates

1. Except as otherwise provided herein, the certificates issued hereafter by the Minister of Education shall be of the following classes:

Junior E Certificate,
Standard E Certificate,
Standard S Certificate,
Professional Certificate.

Limitation on Permanent Certificates

No person other than a British subject or Canadian citizen is eligible to receive a permanent Alberta teacher's certificate.

Statement of Age and Citizenship

"Statement of Age and Citizenship" forms must be completed by each applicant for an Alberta teacher's certificate.

Grade Ranges of Certificates

2. The range of school grades throughout which each of the teachers' certificates mentioned above is a valid license to teach is shown in the following schedule:

Certificates	*Grades*
Junior E	I-IX
Standard E	I-IX
Standard S	IV-XI
Professional	I-XII

The Junior E Certificate

3. (a) Teachers prepared in Alberta or under other jurisdictions prior to September 1, 1962, may be issued Interim Junior E Certificates, provided their academic and professional qualifications are acceptable to the Minister.

(b) Before the Interim Junior E Certificate may be made permanent, the holder:

(i) must provide evidence to the Department of Education through the Faculty of Education that he possesses matriculation standing that will admit him to a Bachelor of Education program,

(ii) must teach successfully in Alberta schools for two years, and

(iii) must be recommended by a Superintendent or Inspector of Schools.

The Standard E Certificate

4. (a) A person who has completed satisfactorily the first two years of the B.Ed. program of the University of Alberta prescribed for teachers of elementary and junior high school grades may be granted an Interim Standard E Certificate.

(b) Before the Interim Standard E Certificate may be made permanent, the holder:

(i) must teach successfully in Alberta schools for two years, and

(ii) must be recommended by a Superintendent or Inspector of Schools.

The Standard S Certificate

5. (a) A person who has completed satisfactorily the first two years of the B.Ed. program of the University of Alberta prescribed for teachers of the high school grades may be granted an Interim Standard S Certificate.

(b) The interim Standard S Certificate may be made permanent as in 4(b) above.

(c) Graduates from the Junior E program, or from a regular Normal School one-year program, will enter a six-course program for the second year of the elementary route, or a seven-course program for the second year of the secondary route. (See DETAILS OF PROGRAMS.)

The Professional Certificate

6. (a) A person who has completed satisfactorily three years of the B.Ed. program of the University of Alberta prescribed for teachers of the elementary and junior high school grades or of the high school grades may be granted an Interim Professional Certificate.

(b) The Interim Professional Certificate may be made permanent as in 4 (b) above.

The Certification of University Graduates

7. (a) The holder of a bachelor's degree, an Honors bachelor's degree or a Master's degree acceptable to the Minister and including necessary prerequisites may be granted an Interim Professional Certificate upon completion of one year's approved work in the Faculty of Education.

(b) Such Interim Certificates may be made permanent as in 4 (b) above.

Teachers with Permanent Certification

8. The requirements for a permanent certificate may be waived in the case of a teacher qualifying for any certificate, provided he previously held an Alberta permanent certificate of another class.

B. (Existing Certificates)

Exchange of Certificates

9. The holder of a certificate or license issued under former regulations may, upon application to the Minister, exchange it for a new certificate as indicated in the following table:

Table of Certificate Ratings

Certificates named in O.C., No. 70-50 or in former Regulations	*Equivalent Certificates*
Temporary License	Interim Junior E
Junior Elementary and Intermediate School Certificate	Interim Junior E
Second-Class Certificate (see section 10 below)	Junior E
Elementary and Intermediate School Certificate	Junior E (with teaching privileges extended to include Gr. X)
Senior Elementary and Intermediate School Certificate	Standard E
Junior Certificate for the High School	Standard S
First-Class Certificate	Standard E and Standard S (with teaching privileges extended to include Gr. XII)
High School Certificate	Professional
Academic Certificate	Professional
First-Class Certificate with Bachelor's degree	Professional

Second-Class Certificate

10. The holder of a permanent Second-Class Certificate may be granted a Junior E Certificate upon the completion of B.Ed. matriculation or one approved summer session of work taken either before or after the coming into effect of these regulations and if recommended by a Superintendent or Inspector of Schools. The holder of a Second-Class Certificate, either interim or permanent, shall be entitled to teach grades one to nine inclusive.

DETAILS OF PROGRAMS

INTRODUCTION

In this section the course requirements of the following programs are described:

A. B.Ed. Program—Elementary Route
B. B.Ed. Program—Secondary Route
C. Special Transfer Program for Certificated Teachers: Elementary and Secondary
D. B.Ed. Programs in Industrial Arts
E. Special Transfer Program for Certified Teachers : Ind. Arts
F. B.Ed. Program in Vocational Education—Route 1
G. B.Ed. Program in Vocational Education—Route 2
H. B.Ed. Program for Holders of Approved Degrees
I. Advanced Study in Education

Junior Elementary Certificate

1. Before a person who holds the Interim Junior Elementary Certificate may proceed to a Bachelor of Education program he must provide evidence to the Dean of the Faculty of Education that he has met matriclulation standing (See ADMISSION.)
2. Persons with deficiencies in the Junior Elementary program will be permitted to clear these deficiencies by completing satisfactorily appropriate subjects approved by the Dean of the Faculty of Education.

BASIC GRADUATION REQUIREMENTS (Applicable to A, B, C, D, E, F, G, and H below)

1. To be granted the B.Ed. degree a student must obtain a stanine average of at least 5.0 in all courses credited on the last two years of the degree program. Only two standings at stanine 3.0 level will be permitted on the four-year B.Ed. program.
2. A student will not be allowed to write more than five supplemental examinations in the total program.
3. A student will not be allowed to write more than two supplementals in one year.
4. A student who is repeating a year will be granted no supplemental privileges in the courses taken that year and must pass all courses with a stanine average of at least 4.6 to be allowed to continue.
5. The privilege of repeating a year will be granted to a student not more than once during his candidacy for a degree in the Faculty of Education.
6. The privilege of repeating a failed course will not be granted more than once.
7. The maximum number of additional courses, including repeated courses, in which a student may enrol for completion of a B.Ed. degree program

may not exceed by more than five the number of courses required for completion of any B.Ed. program.

To meet graduation requirements after November, 1966, students will be placed on the stanine system and will meet the regulations mentioned above under Basic Graduation Requirements. Students will be allowed to graduate with at least a 60% average on the four years of the B.Ed. program, provided they do so before May, 1967. Students will be informed of the method of converting their former marks to stanines.

General Note:

A student, in any Winter Session, unable to complete Student Teaching because of Faculty Regulations based on School Board policies will be required to withdraw from the Student Teaching Program and re-register for the Student Teaching course in a subsequent year.

The above applies to Ed. CI 200, 250, 400 and 450.

A.—Standard Elementary B.Ed. Route

Upon completion of the first two years, candidates are eligible for the Interim Standard E Certificate, valid in Grades I to IX; upon completion of three years, the Interim Professional Certificate valid in Grades I to XII; and upon completion of four years, the B.Ed. degree.

Elementary Route Program

First Year

1. Ed. Fdn. 201 and Ed. Adm. 261
2. Ed. Psy. 276
3. English 200 or 210
4. Major

*5. Approved Arts or Science option

6. Physical Education 218 (men) or 228 (women)

Second Year

(For Special Transfer Second Year, Elementary Route, see C below.)

1. Ed. CI 205 and Ed. CI 231
2. Ed. CI 209 and Ed. CI 213
3. Ed. CI 221 and Ed. CI 237
4. P.E. 337 and Ed. CI 227
5. Ed. CI 200
6. Major

Elementary Route students in the *Second Year* do not continue classes in subjects listed under 1, 2, 3, 4, during student teaching.

Third Year

1. Ed. Psy. 476
2. Philosophy 240 or 242
3. Approved Social Science or History option

‡4. Approved Arts or Science or Education option

5. Major

Fourth Year

1. Ed. Fdn. 492 or 496
*2. Arts or Science option
*3. Senior Arts or Science or Education option
‡4. Senior Education option
5. Major

General Notes:

Graduation Requirements:

(a) Basic requirements: as outlined in DETAILS OF PROGRAMS—INTRODUCTION.

(b) *Special requirements:
An approved Arts or Science option must be selected from each of *two* fields, chosen from the following six: art, drama, mathematics, music, physical education, and science. (Exclusive of *major* field)

(c) Students may delay Student Teaching and Certification until the third year in consultation with the Head of the Department of Elementary Education or his representative.

(d) ‡Only two senior education options may be used in the program.

(e) Ed. Fdn. 496 is an alternate to Ed. Fdn. 492. Students may **not** present both Ed. Fdn. 492 and Ed. Fdn. 496 on the B.Ed. program.

Elementary Route Major Fields

Candidates must select a major field of study. Courses are to be chosen according to the patterns listed below.

I. Art
1. }Two of Art 230, 240
2. }or 310
3. One of Art 330, 340 or 350
4. Ed. CI 410

II. English
†1. English 288 or Lingiustics 389
2. English 398
3. Any senior English or Linguistics
4. Ed. CI 420, 422 or 438

III. Early Childhood Education
1, 2, 3. Three of Art 200 or 230; Drama 240 or 250; English 398; Music 200 or 210; or Physical Education 202.
4. Ed. CI 420 or 426

IV. French
1. French 201
2. French 330
3. Approved Senior French
4. Ed. CI 436

V. Mathematics
1. Mathematics 274
2. Mathematics 374
3. Mathematics 242
4. Ed. CI 428

VI. Music
1. Music 200
2. Music 300
3. Music 250 or 400
4. Ed. CI 414

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†An Arts or Science option may be taken in the first year in lieu of a course in the major.

VII. Physical Education
1. Physical Education 202
2. Physical Education 325 and 327
3. Physical Education 419 and 421
4. Physical Education 431 and one of P.E. 427 or 433

VIII. Science
1. three laboratory science courses
2. in at least
3. two different fields
4. Ed. CI 432

IX. Social Studies
1. A basic (200 level) course in social science or history
2. Two senior courses in the
3. field chosen as a major
4. Ed. CI 406

Note: The courses of the major must be in a field other than that selected as a social science or history option in the third year.

Use of Options

Students should give careful consideration to the various opportunities provided by the Arts or Science option, the Education option, and the Senior Arts or Science or Education option in the Elementary Route program. These may be regarded as "free" options and used to explore a variety of fields; or they may be patterned in such a way as to provide some preparation for certain functions related to teaching in the elementary school.

The following are illustrative of the ways in which these courses may be patterned:

1. *Elementary School Libraries*
Ed. CI 346
Ed. CI 446
English 398 or an approved Arts option

2. *Education of exceptional children in the elementary school*
   Ed. Psy. 354
   One of Ed. Psy. 450, 452, 454, 456, or 458
   One of Genetics 351, Psychology 360, Sociology 320 or 370
   OR
   Two of Psychology 336, 341, 353, 365, 366, 383, 431, 475, or 489.

3. *Early Childhood Education*
   Ed. CI 420
   Ed. CI 426
   An approved Arts or Science option

4. *Speech Education*
   Ed. CI 341 and 343
   Two approved related options

5. *Further study in the major field*
   Two Arts or Science courses in major field
   One supporting Education option

Other patterns are available in reading, second language instruction, etc.

Students are urged to plan the patterning of these courses in consultation with the Dean or the department head.

Program in Intercultural Education

Course requirements

Year III—Sociology 202 or 380 or Anthropology 302 or 305 (approved social science or history option)
—Approved linguistics (approved arts or science option)

Year IV—Ed. Fdn. 416. Anthropology and Education (senior arts, science, or education option)
—Ed. CI 340 Teaching English as a Second Language (senior education option)

Practicum

A minimum of two practicums (or equivalent experience) selected from among the following:

Before the *beginning* of Year III—standard pre-employment practicum and/or experience in community development in a non-teaching situation

At *end* of Year III —practicum in an intercultural situation

At *end* of Year IV —pre-employment practicum

Graduation requirements

As for the regular program, except that a course in linguistics may be presented in lieu of one of the two special course graduation requirements.

Those interested in this program are urged to consult with the Head of the Department of Elementary Education.

B.—Standard Secondary B.Ed. Route

Upon completion of the first two years, candidates are eligible for the Interim Standard S. Certificate, valid in Grades IV to XI; upon completion of three years, the Interim Professional Certificate, valid in Grades I to XII; and upon completion of four years, the B.Ed. degree.

Secondary Route Program

First Year

1. Ed. Fdn. 201 and Ed. Adm. 261
2. Ed. Psy 276
3. English 200* or 210
   *English majors must elect English 200.
4. Major
5. Approved Arts or Science option
6. Physical Education 218 (men) or 228 (women)

Second Year

(For special transfer second year, secondary route, see C below.)

1. Approved Social Science or History
2. Curriculum and Instruction (Major Field)
3. Ed. CI 250
4. Major
5. Major or Arts or Science option

Third Year

1. Ed. Psy 476
2. Phil. 240, or Phil. 242
3. Senior Education option
4. Major
5. Major or Arts or Science option

Fourth Year

1. Ed. Fdn. 492 or 496
2. Senior Education option
3. Major
4. Major or Arts or Science option
5. Major or Arts or Science option

General Notes

1. At least three courses in the major field must be completed by the end of the second year.
2. Basic graduation requirements: See DETAILS OF PROGRAMS—INTRODUCTION.
3. Students may delay Student Teaching and Certification until the Third or Fourth year in consultation with the Head of the Department of Secondary Education or his representative.
4. Ed. Fdn. 496 is an alternate to Ed. Fdn. 492. Students may **not** present both Ed. Fdn. 492 and Ed. Fdn. 496 on the B.Ed. program.

Secondary Route Major Fields

Each candidate must select a major field of study. Courses are to be chosen according to the patterns listed below.

Major Field	*Prescribed Core*	*Supporting Courses*
I. English	1. English 288 2. Three of English 332, 356, 3. 364, 373, 380, 383, 384, 388, 4. 392, 393, 396, or Linguistics 389 5. Any senior English course *or* Linguistics 389 *or* Drama 240	6. Any two senior English 7. courses *or* two approved courses in history, foreign language, the fine arts, classics or linguistics
II. French	1. French 201 2. French 330 3. Linguistics 370 4. One of French 360, 370, 375, 380, or 399 5. French 400	6. Any one of the courses 7. listed under 4 and a senior Arts option *or* Two approved courses in history, English, or other languages
III. German	1. German 200 2. German 330 3. German 350 4. Two senior 5. German courses	6. Any senior German course and 7. a senior Arts option *or* Two approved courses in history, English, or other languages
IV. Latin	1. Latin 200 2. Latin 300 3. Latin 373 4. Latin 374 5. Latin 375	6. Classics 350 or 351 7. Roman history 353 or a senior Latin course *or* Two approved courses in history, English, or other languages
V. Other Foreign Languages	1. 2. 3. Any five approved courses 4. 5.	6. Two approved courses in 7. history, English or other languages

Major Field	*Prescribed Core*	*Supporting Courses*
VI. Social Studies	1. History 200 2. History 370 3. Geography 201 4. Geography 300	5. ⎫ Two approved social 6. ⎭ science or history courses, one of which must be in a field other than history or geography 7. Approved senior social science or history course
VII. Mathematics	1. Mathematics 274 2. Mathematics 201 or 207 or 180 3. Mathematics 374 4. Approved senior mathematics 5. Statistics 255	6. ⎫ Two senior mathematics 7. ⎭ courses *or* two approved courses in a related field .
VIII. Biological Sciences	1. Biology 130 2. Biology 230 3. Approved Senior Zoology 4. ⎫ Chemistry 230 5. ⎭ Chemistry 350 *or* Chemistry 250 Approved senior Zoology, Botany, Entomology, or Genetics	6. An approved senior botany course 7. An approved senior course in biology, biochemistry, entomology, or genetics
	*Students who enter this program with credit in Biology 30 (or equivalent) are not required to take Biology 130. Instead, they will move directly to the second course on the major pattern and take an *approved Botany course* to complete the prescribed core.	
IX. Physical Sciences*	1. Chemistry 230 2. Mathematics 207 or 201 or 220 3. Physics 200 or 240 4. Chemistry 350 5. An approved senior Physics course	6. An approved senior physics or chemistry course 7. An approved course in chemistry, physics, geology, astronomy, meteorology *or* physical geography.
	*Careful attention should be given to the mathematics prerequisites or corequisites for physics courses.	

Major Field	*Prescribed Core*	*Supporting Courses*
X. Art	1. Art 230 2. Art 200 or 240 3. Art 240 or 200 4. Art 310 or Philosophy 350 5. Art 310, 330, 340, 350, 300, 400, or Philosophy 350	6. } Two approved options 7. } in a related field
XI. Music	1. Music 200 2. Music 300 3. Music 400 (or 250 with approval) 4. } Any two of Music 250, 5. } 400, 311, 350, or 450 *or* Philosophy 350	6. } Any two of the courses 7. } listed under 4 and 5 *or* Two approved options in a related field
XII. Drama	1. Drama 250 2. Drama 240 3. Drama 270 4. Drama 480	5. Drama 300 or 400 6. } Two senior drama 7. } courses *or* two approved courses in related field
XIII. Household Economics	1. Chemistry 250 2. Household Economics 201 and 221 3. Household Economics 203* and 307* 4. Household Economics 321 and 325 5. Household Economics 303 and 355	6. Household Economics 350 7. An approved Household Economics option *or* an approved option in a related field
	*Students granted advance placement may subsitiute H.Ec. 205 and 309 for H.Ec. 203 and 307	
XIV. Business Education (a) Secretarial	1. Ed. Bus. 346 or 246 and 345 2. Ed. Bus. 348 or 248 and 347 3. Accounting 200 4. Ed. Bus. 350 5. Business Law 310	6. } Two approved options 7. } in a related field
(b) Accounting-Clerical	1. Ed. Bus. 346 or 246 and 345 2. Accounting 200 3. Ed. Bus. 350 4. Business 202 or 300 or approved alternative 5. Business Law 310	6. } Two approved options 7. } in a related field

NOTE: Normally, students will present 1. and 2. on one of the above patterns as prerequisites to Ed.CI 282.

All students are required to present evidence of competence in typewriting before being admitted to the Business Education program.

Use of Options

Students should give careful consideration to the various opportunities provided by the two Arts/Science Options and the two Education Options in the Secondary B.Ed. program. These may be regarded as "free" options and used to explore a variety of fields; or they may be patterned in such a way as to provide some preparation for certain functions related to teaching in the Secondary School.

The following are illustrative of the ways in which these courses may be patterned:

1. *Guidance in the Secondary School*

   Two of Ed. Psy. 308, 310, or 478
   and
   Two of Soc. 360. 370, Psych. 353 and Psych. 383
   or
   Statistics 255 and two of Soc. 341, Soc. 343 or Psych. 336

2. *Further Specialization in Teaching Field*

   Two Arts or Science courses in the major field
   One advanced Curriculum and Instruction course
   One supporting Education option

3. *Physical Education in the Secondary School*

   Physical Education 232 and 332
   Ed.CI 498
   A related Education option

4. *Teaching in the Junior High School*

   Two Arts or Science options (selected to give breadth)
   Two Education options

5. *Library Services in the Secondary School*

   Ed. CI 346, Ed. CI 446, Eng. 398 or an Arts option,
   a selected Arts or Science option

6. *Intercultural Education*
   (See program under Elementary Education)

Other patterns will be available in speech, special education, etc.

Students are urged to plan the patterning of these courses in consultation with the Dean or the department head.

C.—Special Transfer Second Year for Certificated Teachers

Certificated teachers are granted credit for the first year of the general B.Ed. program for their Normal School or Junior E training, provided that this training was of not less than seven months' duration.

If such certificated teachers have clear matriculation into the Faculty of Education, they will be admitted to the second year of the program. A special program for the second year is provided in order that all essential courses will be included.

It will be noted that candidates taking the Elementary Route have six courses to do; those entering the Secondary Route have seven. The reason for this extra load is that all one-year training was in the field of elementary education.

Students take five courses in a winter session. A summer session is required to complete the *transfer* second year.

Note: Students entering the Secondary Route must present credit in at least one course in the major field as prerequisite to the second and third courses in the major field and as prerequisite to Curriculum and Instruction course in the transfer year. Hence the summer session will normally be taken prior to the transfer year.

Second Year

Elementary Route

1. English 200 or 210
2. Major
3. Major
4. Arts or Science option
5. Arts or Science option
6. Sr. Education option

Secondary Route

1. Major
2. Major
3. Approved Social Science or History
4. English 200 or 210
*5. Curriculum and Instruction (major field)
6. Major
7. Major or Arts or Science option

Third and Fourth Years

As prescribed for these years in the regular programs for the B.Ed. degree—Elementary or Secondary Route.

Special Programs

In all special programs, students may qualify for the Interim Standard S Certificate, valid in Grades IV to XI, at the end of the second year.

D.—B.Ed. in Industrial Arts

Basic Bachelor of Education in Industrial Arts Program—Edmonton

First Year

1. Ed. IA 203 and Ed. Adm. 261
2. Ed. Psy 276
3. English 210
4. Approved Mathematics course
5. Ed. IA 260
6. Physical Education 218 (Men), 228 (Women)

Second Year

(For special transfer second year, I.A., see below)

1. Approved Chemistry course
2. Ed. CI 250
3. Approved Physics course
4. Approved Social Science course
5. Ed. IA 270

Certification: Interim Standard S Certificate

Third Year

1. Ed. Psy 476
2. Philosophy 240 or 242
3. Approved Arts or Science option
4. Ed. IA 360
5. Ed. IA 370

Certification: Interim Professional Certificate

Fourth Year

1. Ed. Fdn. 492 or 496
2. Approved Social Science course
3. Ed. IA 350
4. Ed. IA 460
5. Ed. IA 470

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*Some observation and student teaching may be required of students registered in these courses.

General Note

1. Basic Graduation Requirements: See DETAILS OF PROGRAMS—INTRODUCTION
2. Transfers may be arranged from former IA Programs to the above.

Basic General Program (Calgary Only)

No further registrations are accepted on the first, second and third years of this program.

Fourth Year

1. Ed. Fdn. 492: Philosophy of Education
2. Ed. Psy 476: Educational Psychology
3. A senior A, B, C option
4. Ed. IA 347: Auto Mechanics
5. Ed. IA 344: Electricity
6. Ed. IA 349: Handicraft
7. Ed. IA 345: Welding

General Note

1. Basic Graduation Requirements: See DETAILS OF PROGRAMS—INTRODUCTION

E.—Special Transfer Second Year on the B.Ed. in Industrial Arts for Certificated Teachers

Second Year

1. Ed. IA 203
2. English 200 or 210
3. Approved Mathematics course
4. Ed. IA 260
5. Approved Chemistry course
6. Approved Physics course
7. Ed. IA 270

F.—B.Ed. in Vocational Education—Route 1

Admission: Matriculation as defined for the general B.Ed. program.

First Year

1. Trade training as verified by a recognized Certificate of Qualification as a Journeyman for a designated trade or equivalent for a non-designated trade. The trade qualification is to be approved by an admissions subcommittee comprised of the Dean of the Faculty of Education, the Head of the Department of Industrial and Vocational Education, the University Admissions Secretary, the Chairman of the Provincial Apprenticeship Board, the Supervisor of Vocational Education of the Department of Education.
2. Experience in a trade or industry calling for the trade training held by the candidate, this also to be verified by the admissions sub-committee.

Second Year

1. Ed. Fdn 201
2. Ed. Adm 261
3. Ed. Voc 204
4. Ed. Psy 276
5. English 210
6. Ed. Voc 280
7. Ed. CI 250

Certification: Interim Standard S Certificate

Third Year

1. Ed. Psy 476
2. Philosophy 240 or 242
3. Ed. Voc 350
4. Junior Arts/Science
5. Junior Arts/Science

Certification: Interim Professional Certificate

Fourth Year

1. Ed. Fdn. 492 or 496
2. Ed. Voc option
3. Senior Arts/Science option
4. Senior Arts/Science option
5. Senior Arts/Science option

Notes:

1. One Arts or Science sequence to be directly related to vocational education
2. One Arts or Science sequence to provide an element of general education
3. Basic Graduation Requirements: See DETAILS OF PROGRAMS—INTRODUCTION

G.—B.Ed. in Vocational Education—Route 2

This program in vocational education is for students coming from vocational high schools or from institutes of technology. Such students have not yet had sufficient work experience to qualify for journeymen's certificates.

Admission:

(a) Matriculation as defined for the general B.Ed. program.

(b) A minimum of 35 credits in Vocational Education with at least a 60% average on these credits.

Students registering in this program should consult the Head of the Department of Industrial and Vocational Education well in advance of the initial registration, since a program of ten weeks field experience is required **before** regular classes begin in September of the First Year.

Ed. Voc. 123: Supervised field experience—July, August and two weeks in September—Total number of weeks ..... 10 weeks

First Year

1. Ed. Fdn. 201
2. Ed. Adm. 261
3. Ed. Psy. 276
4. English 210
5. Approved Mathematics
6. Ed. Voc. 204
7. Physical Education

Ed. Voc. 123: Supervised field experience—May, June, July August and two weeks in September—Total number of weeks ..... 18 weeks

Second Year

1. Ed. Voc. 280
2. Approved Arts/Science option
3. Ed. CI 250
4. Approved Sociology
5. Approved Industrial Arts Laboratory

Ed. Voc. 123: Supervised field experience—May, June, July, August and September fifteenth to the following September fifteenth. (18 weeks plus 52 weeks)—Total number of weeks ..... 70 weeks

Total ..... 98 weeks

Certification: Interim Standard S. Certificate

Third Year

1. Ed. Psy. 476
2. Philosophy 240 or 242
3. Ed. Voc. 350

4. Approved junior Arts/Science option
5. Approved junior Arts/Science option

Ed. Voc. 123: Supervised field experience—May, June, July, August and two weeks in September—Total number of weeks ..... 18 weeks

Total ..... 116 weeks

Certification: Interim Professional Certificate

Fourth Year

1. Ed. Fdn. 492 or 496
2. Approved Sociology
3. Ed. Voc. option
4. Approved senior Arts/Science option
5. Approved senior Arts/Science option

Notes:

1. One Arts or Science sequence to be directly related to vocational education.
2. One Arts or Science sequence to provide an element of general education.
3. Basic Graduation Requirements: See DETAILS OF PROGRAMS—INTRODUCTION.

H.—B.Ed. Programs for Holders of Approved Degrees (B.Ed./AD)

All holders of approved degrees who expect teacher certification will meet at 9:00 a.m. on Monday, September 19, 1966, in Room 129, Education Building, to begin a four-day orientation and observation program in the schools.

(1) Program for Teachers in the Secondary School

NOTE: Students in one of these programs will register as B.Ed./AD 1 or 2 according to year.

First Year

(1) Ed. Adm 461: Educational Administration (2-0; 2-0)
(2) Ed. Psy 476: Educational Psychology (3-0; 3-0)
(3) Ed. CI 450, Observation and Student Teaching
(4) Ed. Fdn 492: Philosophy of Education (3-0; 3-0) or 496: History of Educational Thought (3-0; 3-0)
(5) Education: Curriculum and Instruction (major field) (3-0; 3-0)
(6) Ed. Fdn 414: Educational Sociology (3:0; 3-0) or
Ed. Psy 478: Measurement and Evaluation (3-0; 3-0)
(Satisfactory completion of these six courses permits the student to obtain the Interim Professional Certificate.)

Second Year

(7-11) Five approved courses, at least two of which must be in Education and at least two of which must be in Arts or Science.
(Satisfactory completion of all eleven courses permits the student to apply for the B.Ed. degree).

General Notes:

I. Students who present a degree which does not contain the equivalent of a major as required in the regular secondary route B.Ed. will be required to make up such deficiencies before proceeding with this program. A maximum of two such courses may be credited toward the degree.

II. Students will be required to present a basic course in psychology as a prerequisite for Ed. Psy. 476.

III. Students will be required to present a basic course in philosophy as a prerequisite for Ed. Fdn. 492 or 496.

IV. Holders of approved degrees who do not possess credit in the prerequisites for Ed. Psy. 476 or Ed. Fdn. 492 or 496 or both will be permitted to register in a six-course program leading to the Standard S Certificate.

V. Holders of the B.Com. Degree wishing to enter the Business Education program must have credit in Typewriting 10 of the high school or its equivalent. Students who are deficient in this respect should remove the deficiency by registering in Ed. Bus 246 at Summer Session prior to enrolling in the winter session.

VI. Holders of Approved Degrees who lack psychology or philosophy prerequisites may complete the B.Ed. degree with eleven courses; the program is the same length as for the students who present philosophy and psychology courses as part of their approved degrees.

The program will take one of the following forms:

1. Ed. Adm. 461
2. Ed. CI (major field)
3. Ed. CI 450
4. Ed. Fdn. 414 or Ed. Psy. 478

Lacking Ed. Fdn. 492 or 496 prerequisite	Lacking Ed. Psy. 476 prerequisite	Lacking both Ed. Psy. 476 and Ed. Fdn. 492 or 496 prerequisites
5. Ed. Psy. 476	5. Ed. Psy. 276	5. Ed. Psy. 276
6. Phil 240 or 242	6. Ed. Fdn. 492	6. Phil. 240 or 242
At this point the Standard S Certificate will be recommended.		
7. Ed. Fdn. 492 or 496	7. Ed. Psy. 476	7. Ed. Psy. 476
		8. Ed. Fdn. 492 or 496
At this point the Professional Certificate will be recommended.		
8. Sr. Ed. opt.	8. Sr. Ed. opt.	9. Sr. Ed. opt.
9. Sr. Ed. opt.	9. Arts/Sc./Ed. opt.	10. Sr. Arts/Sc./Ed. opt.
10. Sr. Arts/Sc. or Ed. opt.	10. Sr. Arts/Sc. opt.	11. Sr. Arts/Sc. opt.
11. Sr. Arts/Sc. opt.	11. Sr. Arts/Sc. opt.	

VI. Graduation requirements:

1. To be granted the B.Ed. degree a student must obtain a stanine average of at least 5.0 in all courses credited on the degree program. Only one standing at stanine 3.0 level will be permitted on the two year B.Ed. program. (Those who transfer to the B.Ed. program, University of Alberta, with advanced standing will be required to maintain a

stanine 5.0 average on all courses completed at the University of Alberta toward the B.Ed. degree).

2. A student will not be allowed to write more than two supplemental examinations in the total program for the purpose of obtaining a stanine 4.0 or of raising his stanine average to 5.0.
3. A student will not be allowed to write more than two supplemental in one year.
4. Students will be allowed to graduate with at least a 60% average on the two years of the B.Ed. program, provided they do so before May, 1967 at which time they will be placed on the stanine system of grading.

VII. Provision is made for the planning of the options to provide for further specialization in subject fields, guidance and counselling, library services, intercultural education, and the like.

VIII. *Certified Candidates* (Jr. E or equivalent) will present Ed. Psy 476, Ed. Fdn. 492 and Ed. CI in major field for the Professional Certificate. To obtain the B.Ed. degree, such candidates will present, in addition, items 7 to 11 (inclusive) of the program.

IX. Students interested in qualifying for a Master's degree or Graduate Diploma rather than for the B.Ed., following the Professional Certificate year, should consult the appropriate department regarding requirements for graduate study.

X. The holders of an approved Honors or Masters degree may qualify for the B.Ed. degree by completing the first eight of the required courses and meeting the graduation requirements.

(2) Program For Teachers in the Elementary School

First Year

(1) Ed. Adm 461: Educational Administration (2-0; 2-0)

(2) Ed. Psy 476: Educational Psychology (3-0; 3-0)

(3) Ed. CI 400: Observation and Student Teaching

(4) Ed. Fdn 492: Philosophy of Education (3-0; 3-0) or 496: History of Educational Thought (3-0; 3-0)

(5) Ed. CI 402: Curriculum and Instruction in the Elementary School, I (3-3; 3-3)

(6) Ed. CI 404: Curriculum and Instruction in the Elementary School, II (3-1; 3-1)

(Satisfactory completion of these six courses permits the student to obtain the Interim Professional Certificate.)

Second Year

(7-11) Five approved courses, at least two of which must be in Education and at least two of which must be in Arts or Science.

(Satisfactory completion of all eleven courses permits the student to apply for the B.Ed. degree).

General Notes:

I. Students who present a degree which does not contain the equivalent of a major as required in the regular elementary route B.Ed. will be required to make up such deficiencies before proceeding with this program. A maximum of two such courses may be credited toward the degrees.

II. Students will be required to present a basic course in psychology as a prerequisite for Ed. Psy 476.

III. Students will be required to present a basic course in philosophy as a prerequisite for Ed. Fdn. 492 or 496.

IV. Holders of approved degrees who do not possess credit in the prerequisites for Ed. Psy 476 or Ed. Fdn 492 or both will be permitted to register in a six-course program leading to the Standard E Certificate.

V. Holders of Approved Degrees who lack psychology or philosophy prerequisites may complete the B.Ed. degree with eleven courses; the program is the same length as for the students who present philosophy and psychology courses as part of their approved degrees.

The program will take one of the following forms:

	1. Ed. Adm. 461	
	2. Ed. CI 402	
	3. Ed. CI 404	
	4. Ed. CI 400	
Lacking Ed. Fdn. 492 or 496 prerequisite	Lacking Ed. Psy. 476 prerequisite	Lacking both prerequisities
5. Ed. Psy. 476	5. Ed. Psy. 276	5. Ed. Psy. 276
6. Phil. 240 or 242	6. Ed. Fdn. 492 or 496	6. Phil. 240 or 242
At this point the Standard E Certificate will be recommended.		
7. Ed. Fdn. 492 or 496	7. Ed. Psy. 476	7. Ed. Psy. 476
		8. Ed. Fdn. 492 or 496
At this point the Professional Certificate will be recommended.		
8. Sr. Ed. opt.	8. Sr. Ed. opt.	9. Sr. Ed. opt.
9. Sr. Ed. opt.	9. Sr. Arts/Sc/Ed. opt.	10. Sr. Arts/Sc./ Ed. opt.
10. Sr. Arts/Sc./Ed. opt.	10. Sr. Arts/Sc. opt.	
11. Sr. Arts/Sc. opt.	11. Sr. Arts/Sc. opt.	11. Sr. Arts/Sc. opt.

VI. Graduation Requirements

1. To be granted the B.Ed. degree a student must obtain a stanine average of at least 5.0 in all courses credited on the degree program. Only one standing at stanine 3.0 level will be permitted on the two year B.Ed. program. (Those who transfer to the B.Ed. program, University of Alberta, with advanced standing will be required to maintain a stanine 5.0 overage on all courses completed at the University of Alberta toward the B.Ed. degree).
2. A student will not be allowed to write more than two supplemental examinations in the total program for the purpose of obtaining a stanine 4.0 or of raising his stanine average to 5.0.

3. A student will not be allowed to write more than two supplementals in one year.
4. Students will be allowed to graduate with at least a 60% average on the two years of the B.Ed. program, provided they do so before May 1867 at which time they will be placed on the stanine system of grading.

VII. Provision is made for the planning of the options to provide for specialization in subject fields, early childhood education, reading, education of exceptional children, intercultural education, school libraries and the like.

VIII. *Certificated Candidates* (Jr. E. or equivalent) will present Ed. Psy 476 and Ed. Fdn. 492 or 496 for the Professional Certificate. To obtain the B.Ed. degree, such candidates will present, in addition, items 7 to 11 (inclusive) of the program.

IX. Students interested in qualifying for a Master's degree or Graduate Diploma rather than for the B.Ed., following the Professional Certificate year, should consult the appropriate department regarding requirements for graduate study.

X. The holder of an approved Honors or Masters degree may qualify for the B.Ed. degree by completing the first eight of the required courses and meeting graduation requirements.

(3) Program for Vocational Education Teachers

An eleven-course program leading to a B.Ed. in Vocational Education for holders of approved degrees (e.g. B.Sc. in Engineering, B.Comm., B.Sc. in Home Ec.) as follows:

First Year

(1) Ed. Adm 461
(2) Ed. Psy 476
(3) Ed. Voc 480
(4) Ed. CI 450
(5) Ed. Fdn 492 or 496
(6) Ed. Voc 404

(Satisfactory completion of these six courses permits the student to obtain the Interim Professional Certificate.)

Second Year

(7-11) Five approved courses, at least two of which must be in Education and at least two of which must be in Arts or Science.
(Satisfactory completion of all eleven courses permits the student to apply for the B.Ed. degree).

GENERAL NOTES:

I. Candidates must hold a Journeyman's Certificate or have had preparation and experience recognized by the University as equivalent.

II. Students will be required to present a basic course in psychology as a prerequisite for Ed. Psy. 476.

III. Students will be required to present a basic course in philosophy as a prerequisite for Ed. Fdn. 492 or 496.

IV. Holders of approved degrees who do not possess credit in the prerequisites for Ed. Psy 476 or Ed. Fdn. 492 or 496 or both will be permitted to register in a six-course program leading to the Standard S Certificate.

V. Holders of Approved Degrees who lack psychology or philosophy prerequisites may complete the B.Ed. degree with eleven courses; the program is the same length as for the students who present philosophy and psychology courses as part of their approved degrees.

The program will take one of the following forms:

1. Ed. Adm. 461
2. Ed. Voc. 480
3. Ed. CI 450
4. Ed. Voc. 404

Lacking Ed. Fdn. 492 or 496 prerequisite	Lacking Ed. Psy, 476 prerequisite	Lacking both Ed. Psy. 476 and Ed. Fdn. 492 or 496 prequisites
5. Ed. Psy. 476	5. Ed. Psy. 276	5. Ed. Psy. 276
6. Phil. 240 or 242	6. Ed. Fdn. 492 or 496	6. Phil. 240 or 242
At this point the Standard S Certificate will be recommended.		
7. Ed. Fdn. 492 or 496	7. Ed. Psy. 476	7. Ed. Psy. 476
		8. Ed. Fdn. 492 or 496
At this point the Professional Certificate will be recommended.		
8. Sr. Ed. opt.	8. Sr. Ed. opt.	9. Sr. Ed. opt.
9. Sr. Ed. opt.	9. Sr. Arts/Sc./Ed. opt.	10. Sr. Arts/Sc./Ed. opt.
10. Sr. Arts/Sc. opt.	10 Sr. Arts/Sc. opt.	11. Sr. Arts/Sc. opt.
11. Sr. Arts/Sc. opt.	11. Sr. Arts/Sc. opt.	

VI. Graduation Requirements:

1. To be granted the B.Ed. degree a student must obtain a stanine average of at least 5.0 in all courses credited on the degree program. Only one standing at stanine 3.0 level will be permitted on the two year B.Ed. program. (Those who transfer to the B.Ed. program, University of Alberta, with advanced standing will be required to maintain a stanine 5.0 average on all courses completed at the University of Alberta toward the B.Ed. degree).

2. A student will not be allowed to write more than two supplemental examinations in the total program for the purpose of obtaining a stanine 4.0 or of raising his stanine average to 5.0.

3. A student will not be allowed to write more than two supplementals in one year.

4. Students will be allowed to graduate with at least a 60% average on the two years of the B.Ed. program, provided they do so before May, 1967 at which time they will be placed on the stanine system of grading.

VII. Provision is made for the planning of the options to provide for further specialization in subject fields, guidance and counselling, library services, and the like.

VIII. *Certificated Candidates* (Jr. E. or equivalent) will present Ed. Psy 476, Ed. Fdn 492 or 496 and Ed. Voc. 480 and Ed. Voc 404 for the Professional Certificate. To obtain the B.Ed. degree, such candidates will present, in addition, items 7 to 11 (inclusive) of the program.

IX. Students interested in qualifying for a Master's degree or Graduate Diploma rather than for the B.Ed., following the Professional Certificate year, should consult the Department of Industrial and Vocational Education regarding requirements for graduate study.

I. ADVANCED STUDY IN EDUCATION

(1) Graduate Diploma Programs in Education

The Faculty of Education sponsors a series of diploma programs providing additional special qualifications in designated areas. Admission to the Graduate Diploma Program will be granted to holders of an approved degree and a Professional (in some Departments the Permanent Professional) Teaching Certificate or its equivalent. Normally, courses taken prior to the 1963 Summer Session may not be credited toward the Diploma unless the student is currently a candidate for the M.Ed. degree. Students who now hold the M.Ed. degree may not obtain the Diploma on the basis of course marks obtained on the M.Ed. degree program. Courses credited toward the diploma may not also be credited toward the B.Ed. degree. The pass mark for courses to be credited toward the Diploma is 65%. Residence requirements for the Diploma may be met in consecutive summer sessions or in a winter session.

Diploma programs are offered by all Departments of the Faculty. Enquiries should be directed to the office of the Department concerned.

NOTE: When a diploma program has been approved, the student must apply to the Dean's office for the diploma on the form provided by the department concerned. Diplomas are not issued until formal application has been made.

(2) Graduate Degrees in Education

All candidates for advanced degrees register with the Faculty of Graduate Studies which administers graduate programs throughout the University.

In the Faculty of Education graduate work is offered for the preparation of teachers, supervisors, guidance workers, administrators and other educational specialists, and may lead to the degrees of Master of Education, Doctor of Education and Doctor of Philosophy. Candidates for these advanced degrees specialize in terms of the departmental organization of the Faculty of Education as follows:

Department of Elementary Education: curriculum and instruction in kindergarten, primary and elementary education (Grades I - VI). Head—Dr. W. H. Worth.

Department of Secondary Education: curriculum and instruction in secondary education. (Grades VII-XII). Head—Dr. G. L. Berry.

Department of Educational Foundations: philosophy, sociology, and history of education. Head—Dr. B. E. Walker.

Department of Educational Psychology: child and adolescent psychology, educational psychology, guidance, mental hygiene, special education, clinical psychology, tests and measurements. Head—Dr. B. R. Corman.

Department of Educational Administration: school administration (elementary and secondary), general supervision, school finance and business administration, chief administrative roles. Head—Dr. A. W. Reeves.

Department of Industrial and Vocational Education: Industrial Arts and Vocational Education. Head—Dr. H. R. Ziel.

In order to meet the needs and interests of candidates, the departments permit considerable flexibility in the programs leading to advanced degrees. In general, students pattern their courses from the offerings of the department of their choice supplemented by approved courses from other departments of the University. Normally a candidate for the master's degree must present a program consisting of six courses and a minor thesis. A candidate for the master's degree is required to spend at least one academic year in study and research in residence at the University of Alberta. A candidate for the doctor's degree (if he already holds a master's degree) is normally required to spend two academic years in study and research in residence at the University of Alberta.

Graduate courses in education are offered in both the regular and the summer sessions.

Initial Procedure: Students who wish to inquire about graduate programs should address all preliminary inquiries to the Dean of the Faculty of Graduate Studies, University of Alberta, Edmonton.

After a student has decided upon an area of specialization, he should communicate directly with the appropriate department head and, if possible, arrange for an interview. By this means the student's eligibility will be determined and further information given about the degree programs available in the Department.

(3) Special Students

A student holding a B.Ed. degree or the equivalent and not desiring to register for a graduate degree or not meeting all the requirements for admission to the Faculty of Graduate Studies, may register in the Faculty of Education as a *special* student.

DETAILS OF COURSES

NOTE: The hours of instruction per week for both terms are shown at the top of each course description. The first figure in each term indicates lecture hours and the second laboratory hours. Courses which may be taught in either term are indicated by the words "half-year". Even numbered courses are full courses; odd numbered courses are half courses.

STAFF OF THE FACULTY OF EDUCATION

DEPARTMENT OF EDUCATIONAL ADMINISTRATION—

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Associate Professors—L. R. Gue, W. D. Knill, D. A. Mackay, E. Miklos, J. E. Seger.

Assistant Professors—E. W. Ratsoy, W. G. Roberts.

DEPARTMENT OF EDUCATIONAL FOUNDATIONS—

Professor—B. E. Walker (Head).

Associate Professors—N. C. Bhattacharyya, B. Y. Card, S. A. Earl, G. R. Eastwood, H. Garfinkle, M. R. Lupul, J. H. Thompson.

Assistant Professors—A. D. Fisher, R. S. Patterson.

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY—

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Associate Professors—J. D. Ayers, J. E. Bicknell, J. K. Bishop, D. R. Cameron, W. B. Dockrell, M. Gulutsan, S. Hunka, V. R. Nyberg.

Assistant Professors—Rivka Bartell, F. J. Boersma, F. N. Dyer, J. L. Dyer, G. R. Lefrancois, H. W. Zingle.

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Associate Professors—Muriel A. Affleck, R. D. Armstrong, J. K. Bishop, Helen M. Diemert, Elizabeth Filipkowski, Dorothy M. Lampard, L. D. Nelson, W. F. Reese, L. D. Stewart, L. G. Wiedrick, L. L. Wilson.

Assistant Professors—T. P. Atkinson, B. R. Cutler, Patricia Lane, R. E. Stephens, R. L. Ware.

DEPARTMENT OF SECONDARY EDUCATION—

Professors—G. L. Berry (Head), E. W. Buxton.

Associate Professors—J. B. Bell, Geraldine Farmer, C. G. Hampson, M. Nay, W. Pilkington, A. A. Smith.

Assistant Professors—K. L. Bowers, M. A. Clark, Patricia Lane, Madeleine J. Monod, D. V. Parker, J. O. Regan, S. E. Sigurdson, D. W. R. Wilson.

DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION—

Professor—H. R. Ziel (Head).

Associate Professor—H. D. Tichenor.

Assistant Professors—J. E. Gallagher, T. R. Jenson, A. Meyers, C. H. Preitz.

I—CURRICULUM AND INSTRUCTION (Ed. CI)

Elementary Education

A. Undergraduate Courses

Ed. CI 200. (100 hrs.)
Student Teaching in the Elementary School—Corequisite: Curriculum and Instruction courses in the second year.

Ed. CI 205. (3L;0-0)or(0-0; 3L)or(1 1/2L; 1 1/2L)
Curriculum and Instruction in Elementary School Social Studies

Ed. CI 209. (3L;0-0)or(0-0; 3L)or(1 1/2L; 1 1/2L)
Curriculum and Instruction in Elementary School Art

Ed. CI 213. (3L;0-0)or(0-0; 3L)or(1 1/2L; 1 1/2L)
Curriculum and Instruction in Elementary School Music

Ed. CI 221. (3L;0-0)or(0-0; 3L)
Curriculum and Instruction in Elementary School Reading

Ed. CI 227. (3L;0-0)or(0-0;3L)
Curriculum and Instruction in Elementary School Mathematics

Ed. CI 231. (3L;0-0)or(0-0;3L)or(1 1/2L;1 1/2L)
Curriculum and Instruction in Elementary School Science

Ed. CI 237. (3L;0-0)or(0-0;3L)
Curriculum and Instruction in Elementary School Language

Ed. CI 340.
Teaching English as a Second Language—Prerequisite: A teaching certificate, and an approved course in Linguistics.

Ed. CI 341. (3L; 0-0)or(0-0; 3L)
Introduction to Speech Education—Prerequisite: A teaching certificate.

Ed. CI 343. (3L; 0-0)or(0-0; 3L)
Speech in the Elementary School—Prerequisite: Ed. CI 341.

Ed. CI 346. (3-0; 3-0)
School Library Services—Prerequisite: A teaching certificate.

Ed. CI 400. (100 hrs.)
Student Teaching in the Elementary School—Corequisite: Ed. CI 402 and Ed. CI 404.

Ed. CI 402. (3-3; 3-3)
Curriculum and Instruction in the Elementary School I

Ed. CI 404. (3-1; 3-1)
Curriculum and Instruction in the Elementary School II

Ed. CI 406. (3-0; 3-0)
Social Studies in Elementary Education—Prerequisite: Ed. CI 205 or equivalent, and at least one basic course in social science or history.

Ed. CI 410. (3-0; 3-0)

Art in the Elementary School—Prerequisites: Ed. CI 209 or equivalent, and at least one laboratory or studio course in Art.

Ed. CI 414. (3-0; 3-0)

Music in the Elementary School—Prerequisites: Ed. CI 213 or equivalent, and at least one course in music.

Ed. CI 420. (3-0; 3-0)

Reading at the Primary Level—Prerequisites: Ed. CI 221 or equivalent, and teaching experience or fourth year standing.

Ed. CI 422. (3-0; 3-0)

Reading at the upper Elementary and Secondary Levels—Prerequisite: A teaching certificate.

Ed. CI 424. (0-3; 0-3)

Diagnostic and Remedial Program

Ed. CI 426. (3-0; 3-0)

Curriculum and Instruction in the Kindergarten—Prerequisite: A teaching certificate.

Ed. CI 428. (3-0; 3-0)

Mathematics in the Elementary School—Prerequisites: Ed. CI 227 or equivalent, and at least one course in Mathematics.

Ed. CI 432. (3-0; 3-0)

Science in Elementary Education—Prerequisites: Ed. CI 231 or equivalent, and at least one laboratory science course.

Ed. CI 436. (3-0; 3-0)

French in the Elementary School—Prerequisites: A teaching certificate and at least one course on the major pattern.

Ed. CI 438. (3-0; 3-0)

Language in Elementary Education—Prerequisites: Ed. CI 237 or equivalent, and *one* of English 288, English 388, or Linguistics 389.

Ed. CI 446. (3-1; 3-1)

Selection and Organization of Library Materials—Prerequisite: Ed. CI 346.

B. Graduate Courses

Ed. CI 500.

Reports and discussion by staff and graduate students to provide candidates for advanced degrees with experience in the selection and evaluation of research problems and procedures. Tne seminar will be offered as arranged. No course credit will be given.

Ed. CI 518. (3-0; 3-0)

Physiology and Psychology of Reading—Prerequisite: Ed. CI 430 or Ed. CI 422 or consent of department.

Ed. CI 520. (3-3; 3-3)

Clinical Study of Remedial Reading—Prerequisite: Ed. CI 518 and consent of department.

Ed. CI 522. (3-0; 3-0)

Organization and Supervision of the Reading Program—Prerequisite: Ed. CI 420 or Ed. CI 432 or consent of department.

Ed. CI 528. (3-0; 3-0)

Program Development in Elementary School Mathematics—Prerequisite: Ed. CI 428 or Ed. CI 472, or consent of department.

Ed. CI 538. (3-0; 3-0)

Program Development in Elementary School Language—Prerequisite: Ed. CI 438 or consent of department.

Note: Registration in courses numbered 600 and above is restricted to graduate students; in each course, credit is given according to work done, to a maximum of six hours. Not all are offered every year.

Ed. CI 602.

Conference course in Elementary Education

Ed. CI 618.

Research in Reading

requisite: Ed. CI 254 or 454, or consent of department.

I—CURRICULUM AND INSTRUCTION (Ed. CI)

Secondary Education

A. Undergraduate Courses

Ed. CI 250. (100 hrs.)

Student Teaching in the Secondary School

Ed. CI 254. (3-0; 3-0)

Curriculum and Instruction in Secondary School English—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 258. (3-0; 3-0)

Curriculum and Instruction in Secondary School Foreign Language—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 266. (3-0; 3-0)

Curriculum and Instruction in Secondary School Social Studies—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 270. (3-0; 3-0)

Curriculum and Instruction in Secondary School Mathematics—Prerequisites or corequisities: Three full courses on the major pattern.

Ed. CI 274. (3L; 3L)

Curriculum and Instruction in Secondary School Biological Sciences—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 278. (3L; 3L)

Curriculum and Instruction in Secondary School Physical Sciences—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 282. (3-0; 3-0)

Curriculum and Instruction in Secondary School Business Education—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 286. (3-0; 3-0)

Curriculum and Instruction in Secondary School Household Economics—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 290. (3-0; 3-0)

Curriculum and Instruction in Secondary School Art—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 292. (3-0; 3-0)

Curriculum and Instruction in Secondary School Music—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 294. (3-0; 3-0)

Curriculum and Instruction in Secondary School Drama—Prerequisites or corequisites: Three full courses on the major pattern.

Ed. CI 353. (0-0; 3L)

Speech in the Secondary School—Prerequisite: Ed. CI 341.

Ed. CI 361. (3L; 0-0)

Audiovisual Instruction I—Theory of audiovisual instruction; types of communications media; principles and techniques of teaching with such media; preparation of selected audiovisual materials; operation and care of specialized equipment.

Ed. CI 363. (0-0; 3L)

Audiovisual Instruction II—Selected case studies; experimental and developmental uses of instructional devices; implications for the classroom teacher, the individual learner, class and school organization, and the aims and purposes of education. Prerequisite: Ed. CI 361.

Ed. CI 450. (100 hrs.)

Student Teaching in the Secondary School

Ed. CI 454. (3-0; 3-0)

Curriculum and Instruction in Secondary School English—Prerequisites or corequisites: Five full courses on the major pattern.

Ed. CI 456. (3-0; 3-0)

Advanced Curriculum and Instruction in Secondary School English—Prerequisite: Ed. CI 254 or 454 or consent of department.

Ed. CI 458. (3-0; 3-0)

Curriculum and Instruction in Secondary School Foreign Languages—Prerequisites or corequisites: Five full courses on the major pattern.

Ed. CI 460. (3-0; 3-0)

Advanced Curriculum and Instruction in Secondary School Foreign Languages—Prerequisite: Ed. CI 258 or 458, or consent of department.

Ed. CI 462. (3L; 3L)

Audiovisual Communication in Teaching and Learning—Prerequisite: Ed. CI 361.

Ed. CI 466. (3-0; 3-0)

Curriculum and Instruction in Secondary School Social Studies—Prerequisites or corequisites: Five full courses on the major pattern.

Ed. CI 468. (3-0; 3-0)

Advanced Curriculum and Instruction in Secondary School Social Sciences—Prerequisite: Ed. CI 266 or 466, or consent of department.

Ed. CI 470. (3-0; 3-0)

Curriculum and Instruction in Secondary School Mathematics—Prerequisites or corequisites: Five full courses on the major pattern.

Ed. CI 472. (3-0; 3-0)

Advanced Curriculum and Instruction in Secondary School Mathematics—Prerequisite: Ed. CI 270 or 470, or consent of department.

Ed. CI 474. (3L; 3L)

Curriculum and Instruction in Secondary School Biological Sciences—Prerequisites or corequisites: Five full courses on the major pattern.

Ed. CI 476. (3L; 3L)

Advanced Curriculum and Instruction in Secondary School Biological Sciences—Prerequisite: Ed. CI 274 or 474, or consent of department.

Ed. CI 478. (3L; 3L)

Curriculum and Instruction in Secondary School Physical Sciences—Prerequisites or corequisites: Five full courses on the major pattern.

Ed. CI 480. (3L; 3L)

Advanced Curriculum and Instruction in Secondary School Physical Sciences—Prerequisite: Ed. CI 278 or 478, or consent of department.

Ed. CI 482. (3-0; 3-0)

Curriculum and Instruction in Secondary School Business Education—Prerequisite or corequisites: Five full courses on the major pattern, including Ed. Bus. 246 or 346, and Ed. Bus. 248 or 348, or 350.

Ed. CI 484. (3-0; 3-0)

Advanced Curriculum and Instruction in Secondary School Business Education—Prerequisite: Ed. CI 282 or 482, or consent of department.

Ed. CI 486. ((3-0; 3-0)

Curriculum and Instruction in Secondary School Household Economics—Prerequisites or corequisites: Five full courses on the major pattern.

Ed. CI 490. (3-0; 3-0)

Curriculum and Instruction in Secondary School Art—Prerequisites or co-requisites: Five full courses on the major pattern.

Ed. CI 492. (3-0; 3-0)

Curriculum and Instruction in Secondary School Music—Prerequisites or corequisites: Five full courses on the major pattern.

Ed. CI 494. (3-0; 3-0)

Curriculum and Instruction in Secondary School Drama—Prerequisites or corequisites: Five full courses on the major pattern.

Ed. CI 496. (6L; 6L)

Advanced Curriculum and Instruction in the Fine Arts — Music, Art or Drama—Prerequisite: Consent of department.

Ed. CI 498. (3-0; 3-0)

Curriculum and Instruction in Secondary School Physical Education—Prerequisite: BPE degree or consent of department.

B. Graduate Courses

Ed. CI 550.

Secondary Education Seminar—Reports and discussion by staff and graduate students to provide candidates for advanced degrees with experience in the selection and evaluation of research problems and procedures. The seminar will be offered as arranged. No course credit will be given.

Ed. CI 580. (3-0; 3-0)

Curriculum Development—Curriculum research, theory and practice with particular reference to curriculum aims, content, organization, and change.

Note: Registration in courses numbered 600 and above is restricted to graduate students; in each course, credit is given according to work done, to a maximum of six hours. Not all are offered every year.

Ed. CI 680

Secondary Education—Reading and discussion of research, curriculum, and teaching procedures in *one* of the major fields of the secondary school.

II—EDUCATIONAL FOUNDATIONS (Ed. Fdn.)

A. Undergraduate Courses

Ed. Fdn. 201. (3-0; 0-0)or(0-0; 3-0)

Introduction to Education

Ed. Fdn. 301. (3-1; 0-0)

Open only to students in the Dental Auxiliary program.

Ed. Fdn. 414. (3-0; 3-0)

Sociology of the School—Study of the school as a social institution in the changing society.

Ed. Fdn. 416. (3-0; 3-0)

Anthropology and Education—The nature of anthropology and its relationships to the field of education. The transmission of culture in different societies, with reference to special Canadian communities. Prerequisite: A basic course in anthropology, or consent of department.

Ed. Fdn. 452. (3-0; 3-0)

Issues in Contemporary Education—A critical examination of selected educational issues with special referenc to Canada.

Ed. Fdn. 471. (3-0; 0-0)

Contemporary Systems of Education in Western Europe, the U.S.A. and the U.S.S.R.

Ed. Fdn. 473. (0-0; 3-0)

Contemporary Systems of Education in Selected Countries of Asia and Africa

Ed. Fdn. 481. (3-0; 0-0)

History of Canadian Education Before 1867.

Ed. Fdn. 483. (0-0; 3-0)

History of Canadian Education After 1867

Ed. Fdn. 492. (3-0; 3-0)

Philosophy of Education—A philosophical examination of the logical connection between philosophical theories and recommendations about the aims and practices of education. Attention will be given to the analysis of conceptual problems involved in the understanding and assessment of educational theory and practice. Prerequisite: Philosophy 240 or 242. For holders of approved degrees other basic philosophy courses may be accepted by the department.

Ed. Fdn. 496. (3-0; 3-0)

History of Educational Thought—An historical study of the significance of the contributions of thinkers whose intellectual activities have influenced educational theories and practices in the Western World. Prerequisite: Philosophy 240 or 242. For holders of approved degrees other basic philosophy courses may be accepted by the department.

B. Graduate Courses

Ed. Fdn. 500.

Education Seminar—Reports and discussion by staff and graduate students to provide candidates for advanced degrees with experience in the selection and evaluation of research problems and procedures. The seminar will be offered as arranged. No course credit will be given.

Ed. Fdn. 514. (3-0; 3-0)

Sociology of Education—The analysis of educational institutions using sociological theory and research methods. Prerequisites: Ed. Fdn. 414 or a basic course in sociology or consent of department.

Ed. Fdn. 532. (3-0; 3-0)

Philosophical Foundations of Educational Research—An application of the philosophy of the natural and social sciences to educational research.

Ed. Fdn. 571. (3-0; 0-0)

Studies of Educational Change in Western Nations

Ed. Fdn. 573. (0-0; 3-0)

Functions of Education in the Development of Emerging Nations

Ed. Fdn. 581. (3-0; 0-0)

History of Education in Western Europe Prior to 1900

Ed. Fdn. 583. (0-0; 3-0)

History of Education in the United States Prior to 1900

Ed. Fdn. 585. (3-0; 0-0)

History of Education in Eastern Canada

Ed. Fdn. 587. (0-0; 3-0)

History of Education in Western Canada

Ed. Fdn. 592. (3-0; 3-0)

Philosophy of Education—Critical analysis of educational issues and theories. Prerequisite: Ed. Fdn. 492 or equivalent.

Ed. Fdn. 602.

Selected Topics—Conference course in history, philosophy or sociology of education or comparative education, in which credit is given according to work done to a maximum of six hours.

Note: Registration in courses numbered 600 and above is restricted to graduate students; in each course, credit is given according to work done, to a maximum of six hours. Not all are offered every year.

III—EDUCATIONAL PSYCHOLOGY (Ed. Psy.)

A. Undergraduate Courses

Ed. Psy. 276. (3-0; 3-0)

Introduction to Educational Psychology—An introduction to childhood and adolescence, stressing physical, mental, social, emotional, and personality development; the psychology of learning and of the special learning areas; the application of psychological principles to classroom practice.

Ed. Psy. 308. (3-0; 3-0)

Guidance—Basic principles and techniques of guidance; case studies, interviews, records, with emphasis on scholastic and personal guidance; introduction to the tests and measures most commonly used in guidance. Prerequisite: Ed. Psy. 276 or equivalent.

Ed. Psy. 310. (3-0; 3-0)

Personal Adjustment in Education—Dynamics of behavior, emotional and social adjustment of school children; teacher adjustment; social adjustment in the classroom. Prerequisite: Ed. Psy. 276 or equivalent.

Ed. Psy. 354. (3-1;3 -1)

Psychology and Education of Exceptional Children—Survey course for teachers of atypical children in regular and special classrooms. Observation in selected centres and schools. Prerequisite: Ed. Psy. 276 or equivalent.

Ed. Psy. 450. (3-1; 3-1)

Psychology and Education of Hard-of-Hearing and Deaf Children—Theory, observation and practice. Prerequisite: Ed. Psy. 354 or consent of department.

Ed. Psy. 452. (3-1; 3-1)

Psychology and Education of Mentally Retarded Children—Theory, observation, and practice. Prerequisite: Ed. Psy. 354 or consent of department.

Ed. Psy. 454. (3-1; 3-1)

Psychology and Education of Gifted Children—Theory, observation and practice. Prerequisite: Ed. Psy. 354 or consent of department .

Ed. Psy. 456. (3-1; 3-1)

Psychology and Education of Crippled and Neurologically Impaired Children —Theory, observation, and practice. Prerequisite: Ed. Psy. 354 or consent of department.

Ed. Psy. 458. (3-1; 3-1)

Psychology and Education of Emotionally Disturbed and Socially Maladjusted Children—Theory, observation and practice. Prerequisite: Ed. Psy. 354 or consent of department.

Ed. Psy. 474. (3-3; 3-3)

Education Clinic—(See Ed. Psy. 574).
Prerequisite: Consent of the department.

Ed. Psy. 476. (3-0; 3-0)

Educational Psychology—Individual differences; psychology of learning and forgetting; motivation; personality, adjustment, and mental hygiene; introduction to evaluation and the testing program. Prerequisite: Ed. Psy. 276, Psychology 202 or equivalent.

Ed. Psy. 478. (3-0; 3-0)

Measurement and Evaluation — Measurement of classroom achievement; teacher-made and standardized tests; interpretation and use of test results; evaluation of non-academic achievement; recording and reporting pupil progress. Prerequisite: Ed. Psy. 276 or equivalent.

B. Graduate Courses

Ed. Psy. 500.

Education Seminar—Reports and discussion by staff and graduate students to provide candidates for advanced degrees with experience in the selection

and evaluation of research problems and procedures. The seminar will be offered as arranged. No course credit will be given.

Ed. Psy. 502. (3-1; 3-1)

Introduction to Educational Research—Quantitative and non-quantitative research with applications of elementary statistics to the collection and analysis of data.

Ed. Psy. 508. (3-0; 3-0)

Problems in Educational and Vocational Guidance—Theories of vocational development and choice; group standardized tests and inventories. Prerequisite or corequisite: Ed. Psy. 476.

Ed. Psy. 510 (3-4; 3-4)

Theories of Counselling—Theories and techniques of counselling; supervised laboratory experience; case conference seminar. Prerequisite or corequisite: Ed. Psy. 508 or equivalent.

Ed. Psy. 512. (3-3; 3-3)

Seminar and Practicum in Counselling—Application of counselling theory in a supervised laboratory experience; case conference seminar. Prerequisite or corequisite: Ed. Pys. 510 or consent of the department.

Ed. Psy. 514. (3-3; 3-3)

School Psychology—The role and function of the School Psychologist in programs for children with behaviour, learning, and developmental problems: A program of visitations and supervised work experience. Prereqiusite or corequisite: Ed. Psy. 574.

Ed. Psy. 532. (3-3; 3-3)

Theory and Practice of Research in Educational Psychology—The application of research methods or enquiry to selected processes of formal education. Prerequisite: Ed. Psy. 476 and consent of department.

Ed. Psy. 548. (3-1; 3-1)

Psychology and Education of Exceptional Children—Course for teachers of exceptional children and personnel serving in supervisory roles in special education. Prerequisite: Ed. Psy. 476.

Ed. Psy. 550. (3-1; 3-1)

Teaching Speech to the Deaf—(See Ed. Psy. 450).

Ed. Psy. 552. (3-1; 3-1)

Psychology and Education of Mentally Handicapped Children—(See Ed. Psy. 452).

Ed. Psy. 554. (3-1; 3-1)

Psychology and Education of Gifted Children—(See Ed. Psy. 454).

Ed. Psy. 556. (3-1; 3-1)

Psychology and Education of Physically Handicapped Children—(See Ed. Psy. 456).

Ed. Psy. 558. (3-1; 3-1)
Psychology and Education of Emotionally Disturbed Children—(See Ed. Psy. 458).

Ed. Psy. 570. (3-0; 3-0)
Child Psychology—A systematic study of the growth, development, behavior and problems of adjustment of children of pre-school and elementary school ages. Prerequisite: Ed. Psy. 476.

Ed. Psy. 572. (3-0; 3-0)
Psychology of Adolescence—A systematic study of the growth, development, behavior and problems of adjustment of children of junior and senior high school ages. Prerequisite: Ed. Psy. 476.

Ed. Psy. 574. (3-3; 3-3)
Education Clinic—Training in the measurement of intelligence, achievement, interests, aptitudes and adjustment of school children. Laboratory experience in the Education Clinic in measurement, diagnosis and remedial treatment of school children. Prerequisite: Ed. Psy. 476.

Ed. Psy. 576. (3-1; 3-1)
Statistics and Research Design in Education—Application of descriptive statistics and statistical inference, at an intermediate level, to problems of research design and measurement in education. Prerequisite: Statistics 255 or Ed. Psy. 502.

Ed. Psy. 578. (3-0; 3-0)
Theory and Application of Measurement in Education—Prerequisite: Statistics 255 or Ed. Psy. 502.

Ed. Psy. 592. (3-0; 3-0)
Social Psychology of School and Classroom—Individual behavior as it affects and is affected by the behavior of others; implications of research in leadership and group process for classroom teaching. Prerequisites: Sociology 341, and *one* of Sociology 343, 344, 345, 346.

Note: Registration in courses numbered 600 and above is restricted to graduate students; in each course, credit is given according to work done, to a maximum of six hours. Not all are offered every year.

Ed. Psy. 610. *Advanced Theory and Practice of Counselling.*

Ed. Psy. 670. *Developmental Psychology.*

Ed. Psy. 674. *Problems of Adjustment of School Children.*

Ed. Psy. 676. *The Psychology of Learning.*

Ed. Psy. 678. *Educational Measurement and Experimental Research.*

IV—EDUCATIONAL ADMINISTRATION (Ed. Adm.)

A. Undergraduate Courses

Ed. Adm. 261. (3-0; 0-0)or(0-0; 3-0)
Educational Administration: The Role of the Teacher.

Ed. Adm. 461. (2-0; 2-0)

Educational Administration: The Role of the Teacher—For holders of approved degrees.

B. Graduate Courses

Ed. Adm. 500.

Research Seminar—Non-credit: hours to be arranged.

Ed. Adm. 525. (3-0; 0-0)

Administration of Educational Personnel—The supervisory functions of staffing, consulting, and motivating, including such topics as selection and placement, teacher evaluation, in-service training, individual consultation leadership, teacher morale, use of authority, and organization for supervision.

Ed. Adm. 559. (3-0; 0-0)

Administration of Public Education in Canada—The legal basis of structure and control. Organizational and operational features of provincial school systems. Current administrative problems.

Ed. Adm. 561. (0-0; 3-0)

Evolving Concepts in Educational Administration—Administrative behavior in relation to educational purposes, processes and situations.

Ed. Adm. 563. (0-0; 3-0)

Administration of the Educational Program—Patterns of school organization, curriculum adaptation, staff utilization, pupil personnel practices, program evaluation, and learning materials.

Ed. Adm. 565. (3-0; 3-0)

Educational Finance—Sources of school revenue and analysis of expenditures. Provincial school grants in Canada. The case for federal aid. Plans for equalizing the financial support of public education and major problems involved in their implementation. Principles and practices in the budgeting of school funds. Financial accounting and reporting. Capital expenditures. Salary schedules. Cost analysis.

NOTE: Full-year courses corresponding to the above four half-year courses (525, 559, 561, 563 and 565) are designated Ed. Adm 526, 560, 562, 564 566.

Note: Courses numbered in the 600's are conference courses in which credit is given according to work done, to a maximum of six hours .

Ed. Adm. 626.

Administrative Behavior

Ed. Adm. 660.

Educational Administration—The Social and Political Environment

Ed. Adm. 662.

Organizational Theory

Ed. Adm. 664.

Problems in Educational Administration

Ed. Adm. 666.

Educational Finance

V—BUSINESS EDUCATION (Ed. Bus)

Ed. Bus. 246. (6L; 6L)

Teaching of Typewriting—Typewriting, and the teaching of typewriting in the secondary school. Open to students not eligible for admission to Ed. Bus. 346.

Ed. Bus. 248. (6L; 6L)

Teaching of Shorthand—Shorthand, and the teaching of shorthand in the secondary school. Open to students not eligible for admission to Ed. Bus. 348.

Ed. Bus. 345. (0-3; 0-3)

Typewriting Practice—Advanced Typewriting. Prerequisite: Ed. Bus. 246.

NOTE: Required of candidates who present Ed. Bus 246 for credit on the major in business education.

Ed. Bus. 346. (6L; 6L)

Teaching of Typewriting—Advanced typewriting, and the teaching of typewriting in the secondary school. Prerequisite: Typewriting 20 of the high school with B standing, or the Junior Certificate in Typewriting.

NOTE: Students who do not show sufficient competence in typewriting will be required to register in Ed. Bus. 246. Not open to students who hold credit in Ed. Bus. 246.

Ed. Bus. 347. (0-3; 0-3)

Shorthand Practice—Advanced Shorthand. Prerequisites: Ed. Bus. 248 and Ed. Bus. 246 or 346.

NOTE: Required of candidates who present Ed. Bus. 248 for credit on the major in business education.

Ed. Bus. 348. (6L; 6L)

Teaching of Shorthand—Advanced shorthand, and the teaching of shorthand in the secondary school. Prerequisites: Typewriting 20 and Shorthand 20 of the high school with B standing, or the Junior Certificates in Shorthand and Typewriting.

NOTE: Students who do not show sufficient competence in shorthand will be required to register in Ed. Bus. 248. Not open to students who hold credit in Ed. Bus. 248.

Ed. Bus. 350. (6L; 6L)

Office Training—Office organization and services with special reference to business communication and filing procedures. Introduction to business machines and data processing. Prerequisite: Competence in typewriting, or corequisite: Ed. Bus. 246.

VI—INDUSTRIAL ARTS (Ed. IA)

Ed. IA 203. (3-0; 0-0)

Introduction to Industrial Arts—An examination of past and present theory and practice in Industrial Arts Education.

Ed. IA 260. (3-6; 3-6)

General Industrial Arts—Development of basic knowledge and skill in the following: ceramics, electricity, graphic arts, metals, plastics, wood; organization and management of multiple-activity laboratories.

NOTE: This course is designed to prepare industrial arts majors for teaching in grades seven and eight.

Ed. IA 270. (3-6; 3-6)

Introduction to Technology—Development of basic knowledge and skills in the following technological areas: computer, electricity-electronics, graphic communications, materials and processes, mechanical, power; organization and management of multiple-activity laboratories.

NOTE: This course is designed to prepare industrial arts majors for teaching in grades eight and nine.

Ed. IA 350. (3-0; 3-0)

Educational Programs and Practices in Industry and Labor—Scope, organization, practice and evaluation, of educational programs conducted by management and labor.

Ed. IA 360. (2-4; 2-4)

Laboratory of Technology—Laboratory experiences to acquaint industrial arts majors with interrelationships of technologies and the influence of organization and workers upon quality and cost of product.

Ed. IA 370. (2-4; 2-4)

Technology I—Development of competence in computer and electricity electronics technologies. Prerequisite: Ed. IA 270.

Ed. IA 460. (2-4; 2-4)

Technology II—Development of competence in the areas of materials and processes and power technologies. Prerequisite: Ed. IA 270.

Ed. IA 470. (2-4; 2-4)

Technology III—Development of competence in graphic communications and mechanical technologies. Prerequisite: Ed. IA 270.

Ed. IA 589. (3-0; 0-0)

Organization of Industrial Arts Education.

Ed. IA 591. (0-0; 3-0)

Problems and Trends in Industrial Arts Education.

Ed. IA 594. (3-0; 3-0)

Research and Development Seminar in Industrial Arts Education.

VII. VOCATIONAL EDUCATION (Ed. Voc.)

Ed. Voc. 204. (3-0; 3-0)

Vocational Education—History, comparative studies, aims and objectives.

Ed. Voc. 280. (3-0; 3-0)

Curriculum and Instruction in Vocational Education—General principles of teaching; specialized methods; trade and job analysis; course construction; instructional materials and their use; tests and evaluation; vocational guidance.

Ed. Voc. 350. (3-0; 3-0)

Educational Programs and Practices in Industry and Labor—Scope, organization, practice and evaluation, of educational programs conducted by management and labor.

Ed. Voc. 404. (3-0; 3-0)

Vocational Education—Orientation to vocational education.

Ed. Voc. 480. (3-0; 3-0)

Curriculum and Instruction: Vocational Education—General principles of teaching; specialized methods; trade and job analysis; course construction; instructional materials and their use; tests and evaluation; vocational guidance.

Ed. Voc. 550. *Vocational Guidance—Conference Seminar.* (1-3; 1-3)

Ed. Voc. 589. *Organization of Vocational Education.* (3-0; 3-0)

Ed. Voc. 591. *Problems and Trends in Vocational Education.* (0-0; 3-0)

Ed. Voc. 594. (3-0; 3-0)

Research and Development Seminar in Vocational Education.

ART

200. (3-0; 3-0)

Introduction to the History of Art—Beginning with a discussion of fundamental concepts underlying painting and the plastic arts, this course investigates the major styles and contributions of each important period.

230. (1-4; 1-4)

Fundamentals of Design—The study and practical application of principles of composition and picture-making, methods of construction in design, and the use of conventional and abstract forms.

BIOLOGICAL SCIENCE

Biology 130. (3-3; 3-3)

An introduction to Biology, with emphasis on principles. Not open to students with credit in Biology 30.

Biology 230. (3-3; 3-3)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This Course is prerequisite to most senior biology courses. Prerequisite: Biology 30 or Biology 130.

DRAMA

250. (3-2; 3-2)

Acting Technique and Production—(a) Acting: Practical and theoretical through improvisation, stage performance and discussion. Emphasis is placed on the development of the actor through preparation for a role, acting scenes, and basic voice and body work. Elementary makeup. (b) Production: Practical work in technical practice.

ENGLISH

200. (3-0; 3-0)

A survey of English Literature from Chaucer to the Twentieth Century—A close study of representative masterpieces. Essays and tests on the prescribed literature will be given to afford practice in setting down ideas in good English.

210. (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

288. (3-0; 3-0)

An Introduction to the English Language—A historical and structural study of the sounds, grammar, and vocabulary of English.

398. (3-0; 3-0)

Children's Literature—A historical and critical study of literature written for children, with attention to the interaction between children's literature and educational theory. The course will bring to the attention of prospective elementary teachers some of the world's resources in good books for children. Prerequisite: English 200, 210, or 230. This course is limited to B.Ed. students in the elementary route.

FRENCH

201. (2-3; 2-3)

First Year University French for Teachers—This course is designed to teach all future teachers of French to speak the language. It consists of three laboratory hours or oral work, and two hours of grammar per week.

HOUSEHOLD ECONOMICS

201. (3-3; 0-0)

Clothing Design and Selection—Practical application of principles of design in clothing selection. Becoming and appropriate clothing for the individual. Consideration of age, social and economic factors.

203. (3-3; 0-0)

Clothing Construction and the Basic Pattern—A basic commercial pattern fitted in muslin and developed into a master pattern. Basic garment construction. Construction of a selected dress design in appropriate fabric. Prerequisite: H.Ec. 201.

205. (3-3; 0-0)

Clothing Construction and the Basic Pattern—A basic commercial pattern fitted in muslin and developed into a master pattern. Construction techniques applied to specific problems. Prerequisite: H.Ec. 201.

221. (0-0; 3-3)

Basic Foods I—Scientific principles involved in preparing and handling selected foods: fruits, vegetables, cereals, flours, leaveners, sugars, batters and doughs. Prerequisite: Chemistry 250.

303. (3-3; 0-0)

Household Management—Application of home management principles in use of time, energy and equipment. Selection, arrangement and care of materials and equipment used in the kitchen and laundry.

307. (0-0; 3-3)

Clothing Construction—Construction techniques applied to specific problems. Evaluation of methods used in present-day clothing construction. Consideration of individual resources, need, skills and management. Prerequisite: H.Ec. 203.

309. (0-0; 3-3)

Textiles — Fiber production, yarn development, fabric construction and finishes as applied to end uses in apparel and household fabrics.

321. (3-3; 0-0)

Basic Foods II—Scientific principles involved in preparing and handling selected foods: meats, fish, poultry, eggs, milk, cheese, fats and oils. Prerequisite: Chemistry 250.

325. (0-0; 3-3)

Nutrition—A study of the nutrients essential to human life and well being, their function in metabolism and their sources in food. Laboratory exercises in preparing and serving meals. Prerequisite: H. Ec. 221 and 321 and Chemistry 250.

350. (3-3; 3-3)

Applied Art—The principles and elements of design: selection and arrangement of materials and objects in the home; analysis of house plans. Historic styles of architecture and furniture and their relation to contemporary design.

355. (0-0; 3-0)

Family Finance—Standards of living; family income, savings and expenditures; consumer education.

MATHEMATICS

180. (4-0; 4-0)

Trigonometry and Polynomial Calculus—Trigonometric functions and identities. Solution of triangles. Simple algebraic curves. Differentiation and integration of elementary functions. Applications. Prerequisite: Mathematics 30 or its equivalent.

207. (5-0; 5-0)

Elementary Calculus (Arts and Education)—Real numbers. Functions and graphs. Differentiation and applications. Analytic geometry. Integration and applications. Trigonometric, exponential and inverse functions. Prerequisite: Mathematics 30 and 31 or their equivalents. Corequisite: Some students lacking Mathematics 31 or its equivalent may take Mathematics 207 by taking Mathematics 101 concurrently. (See the conditions under which a student may take Mathematics 101).

220. (3-0; 3-0)

Elementary Calculus — Differentiation and integration of trigonometric functions. Polar co-ordinates. Logarithmic and exponential functions. Conic sections. Areas and volumes. Prerequisite: Mathematics 180.

264. (3-0; 3-0)

Foundations of Mathematics—Axiomatics. Sets and relations. Elementary logic. Classical and modern views of geometry. The number system. Systems of numeration and scales of notation. Measurement. Prerequisite: Mathematics 30 of high school or permission of the Dean.

NOTE: Credit may not be obtained in both Mathematics 264 and Mathematics 274.

274. (3-0; 3-0)

Algebra and Geometry—Logic and sets. Axiomatic geometry. Rotation of axes. Linear equations. Vectors, matrices and determinants. Mathematical systems (scales of notation). Mathematical induction. Binomial theorem. The axiomatic approach to the number system. General algebraic systems. Prerequisite: Mathematics 30.

307. (5-0; 5-0)

Calculus and Analytic Geometry (Arts and Education)—Polar coordinates. Rotation of axes. Analytical geometry of three dimensions. Partial derivatives. Multiple integrals. Sequences and series. Introductory differential equations. Prerequisite: Mathematics 207.

374. (3-0; 3-0)

Algebra and Geometry—Selected topics in projective and other non-euclidean geometries. Groups, rings, fields. Vector spaces. Lattices and Boolean algbera. Prerequisite: Consent of the department.

MUSIC

200. (2-3*; 2-3*)

History of Music and Choral Technique—Elementary theory and practice of singing, choral technique and interpretation, sight singing and ear training. History of music. Introduction to form. Instruments of the orchestra. Assignments include one hour weekly of prescribed listening; records and scores are provided and the listening room is reserved at various times for small groups. Weekly reading will be assigned, part of it related to the listening. Theory:

The student will be required in March (of the session in which the course is taken), to pass an elementary examination in notation with 80% standing.

Prerequisite: (a) Western Board of Music Grade III theory or equivalent and (b) Western Board of Music Grade V practical or equivalent.

210. (2-3; 2-3)

Foundations of Music—The development of a musical repertory and knowledge of basic content appropriate for teachers. (Open to B.Ed. students lacking the prerequisite for Music 200; not to be used as a prerequisite (in place of Music 200) for advanced courses in music.)

PHYSICAL EDUCATION

P.E. 202. (3-3; 3-3)

Introduction to Elementary School Physical Education—A study of children at play. Movement education leading to the development of skill in various fields of physical activity.

P.E. 232. (3-3; 3-3)

Physical Education Curriculum and Instruction (secondary)—Planning and teaching secondary school physical education with emphasis on basic activities and intramural athletics.

P.E. 325. (3-0; 0-0)

Scientific Principles of Elementary School Physical Education—A study of anatomy, physiology of exercise and kinesiology as it relates to the physical growth and development of children aged 6 to 12. Prerequisite: P.E. 202.

P.E. 327. (0-0; 1-2)

Dance—A study of the basic principle of movement and the use of these in the communication of ideas and feelings through dance and dance drama. Prerequisite: P.E. 202 or consent of the department.

P.E. 332. (3-3; 3-3)

Principles of Physical Education (Secondary)—Analysis of factors derived from basic sciences and philosophies as they affect activity selection and basic objectives at the secondary school level.

P.E. 334. (Summer Session only) (3-3; 3-3)

Methods and materials relating to the core curriculum for junior and senior high schools.

P.E. 337 (1-2; 0-0)

Physical Education Curriculum and Instruction (Elementary)—Methods and materials in the teaching of elementary school health and physical education.

P.E. 338. (Summer Session only) (3-3; 3-3)

Analysis of selected individual, dual and team sports related to the core curriculum. Prerequisite: P.E. 334 or consent of department.

P.E. 392. (3-0; 3-0)

Health Education in Secondary Schools—Personal and environmental school health with special emphasis on methods and materials in health instruction.

P.E. 419. (0-0; 3-0)

Problems and Trends in Elementary School Health and Physical Education —Prerequisite: P.E. 202, P.E. 325, P.E. 327, P.E. 422.

P.E. 429 (3-3; 0-0)

Advanced Gymnastics Dance and Games—Students will be encouraged to specialize in an area of their choice. Prerequisite: P.E. 202, 325, 327, 422.

P.E. 492. (3-2; 3-2)

Community Health—Consideration of current research of disease concept and examination of community attitudes and pressures affecting health education. Field research includes hospitals, clinics, institutions and schools.

STATISTICS

255. (3-3; 3-3)

Elementary Statistics—Graphs, tables, diagrams. Frequency distributions, averages, dispersion, moments. Elementary probability. Binomial, normal and Poisson distributions. Sampling. Regression and correlation. Significance tests. Applications to data in various fields. Prerequisite: Mathematics 30.

XIII

The Faculty of Engineering

INFORMATION, REGULATIONS, COURSES

ACADEMIC STAFF OF FACULTY OF ENGINEERING

Dean—R. M. Hardy
Associate Dean—L. E. Gads

Department of Chemical and Petroleum Engineering

Professors—D. B. Robinson (Head of the Department), D. L. Flock, D. Quon
Associate Professors—I. G. Dalla Lana, P. M. Dranchuk, D. G. Fisher, W. Nader, F. D. Otto
Assistant Professors—J. T. Ryan, R. K. Wood
Sessional Instructors

Department of Civil Engineering

Professors—S. R. Sinclair (Head of Department), T. Blench, P. H. Bouthillier, L. E. Gads, R. M. Hardy, J. Longworth
Associate Professors—P. F. G. Adams, K. O. Anderson, J. J. Bakker, W. L. Bigg, E. W. Brooker, E. L. Fowler, J. G. MacGregor, D. W. Murray,* J. B. Nuttall,* A. W. Peterson, W. W. Preston, S. H. Simmonds, S. Thomson, J. P. Verschuren, J. Warwaruk
Assistant Professor—N. Rajaratnam
Sessional Instructors

Department of Electrical Engineering

Professors—G. B. Walker (Head of the Department), J. W. Porteous, P. R. Smy
Associate Professors—D. H. Kelly, Y. J. Kingma, W. A. G. Voss,** V. Gourishankar, H. J. J. Seguin
Assistant Professors—G. S. Christensen, E. M. Edwards, C. G. Englefield, P. A. Goud, V. J. Harwood, C. R. James, R. W. King, K. A. Stromsmoe*
Sessional Instructors

Department of Mechanical Engineering

Professors—G. Ford (Head of Department), J. B. Haddow, J. S. Kennedy
Associate Professors—D. G. Bellow, K. C. Cheng, G. S. H. Lock, D. J. Marsden, D. Panar*, C. M. Rodkiewicz, G. W. Sadler
Assistant Professors—E. W. Johnson, D. W. Pashniak*
Sessional Instructors

Department of Mining and Metallurgy

Professors—E. O. Lilge (Head of Department), T. H. Patching, F. H. Vitovec
Associate Professors—J. Fehling, A. E. Miller
Assistant Professor—L. R. Plitt
Sessional Instructors

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*On leave of absence. **Part-time.

FACULTY OF ENGINEERING

The Faculty of Engineering administers regular four-year programs leading to the B.Sc. Degree in Chemical, Civil, Electrical, Mechanical, Metallurgical, and Mining Engineering. Special patterns are available in the third and fourth years of some of these programs. In addition, for students obtaining a sufficiently high standing in the work of the first two years, special programs may be arranged. Details of all these courses appear under Programs of Study.

Graduate work leading to the M.Sc., and in some cases the Ph.D., degree is offered through the various Engineering Departments under the administration of the Faculty of Graduate Studies. Details of these programs appear in the calendar of the Faculty of Graduate Studies.

ADMISSION REQUIREMENTS FOR PROGRAMS LEADING TO THE B.SC. DEGREE IN ENGINEERING

1. For students who have attended and are completing High School in Alberta, examinations for admission to the University are conducted each year, in June and August, under the authority of the High School and University Matriculation Examinations Board. Applications for these examinations should be made about two months before the date of examinations to the Chairman of the High School and University Matriculations Board, Department of Education, Administration Building, Edmonton.
2. The standard required for admission to the first year of Engineering is—
   (a) an Alberta High School Diploma with
   (b) a Departmental examination mark of 50% or higher in each of the following six courses:
      (1) Chemistry 30*
      (2) English 30
      (3) Mathematics 30
      (4) Mathematics 31
      (5) Physics 30
      (6) Social Studies 30, and
   (c) an average in these courses of at least 60.0%.
3. Students who have completed their High School work outside Alberta will be judged on the Alberta matriculation standard with their High School credits being evaluated by the Registrar and the Dean.

These general regulations notwithstanding, the University may, at its discretion, refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements at the University of Alberta.

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*Students who have passed Chemistry 30 without approved laboratory will be required to satisfy the Department of Chemistry as to their proficiency in laboratory work.

PROCEDURE FOR APPLYING FOR ADMISSION

1. Students who have not previously been registered in the Faculty of Engineering should write to the Registrar and request the application forms and descriptive material.
2. Students who completed the bulk of their high school work two or more years prior to the time of application are required to consult the Dean and the Student Counselling Services by August 1.
3. The application forms should be completed in all detail and submitted with appropriate fee* to the Registrar by August 1.
4. Students are required, before August 1, to arrange with the Examinations Branch of the Department of Education of the province where their High School Training was obtained for the direct transmission by the Department to the Registrar of one copy of the complete transcript of their High School work.
5. Applications must be completed and supported by copies of the transcript before they can be considered. They will be reviewed by the Registrar and the Dean and the applicant will be notified by the Registrar of his acceptability or otherwise.
6. Students who have previously registered in the Faculty of Engineering are not required to reapply for admission to subsequent years and may assume that they are readmissible unless they have been otherwise informed by the Registrar or the Dean.

REGISTRATION

1. All students must register in person at the prescribed time before the start of classes.
2. Students who have been admitted to the Faculty of Engineering for the first time will be informed of the time and place of registration by the Registrar at the time they receive notice of admission.
3. A student is responsible for the completeness and accuracy of his registration. He is also responsible for any adjustment of registration made necessary by the results of supplemental examinations. Particular care should be exercised with regard to the selection of options and patterns where they are available. Registration in courses which directly conflict on the timetable will only be allowed when the permission of the Dean has been secured.
4. Students with registration problems are requested to consult the Dean.
5. Late registration is permitted only in exceptional cases and with the approval of the Dean. If late registration is approved a late registration fee of $3.00 plus $1.00 per day is levied.

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*A fee of $5.00 is charged for the evaluation of high school documents from provinces other than Alberta; a fee of $10.00 is charged for the evaluation of high school documents from outside Canada.

6. Registration is incomplete until fees have been paid, and is subject to cancellation unless payment has been made by the final date noted in the academic schedule.

PROMOTION REGULATIONS OF FACULTY OF ENGINEERING

1. A student who has obtained credit in all but one of the full-year courses prescribed for him in any year may be permitted registration in the subsequent year of the program but, if so, will be required to register in and repeat the failed course.
2. A student who has not obtained credit in all or all but one of the full-year courses prescribed for him in any year is considered to have failed his year and will be denied registration in the subsequent year of the program.
3. A student who has failed two or more of the full-year courses prescribed for him in any year may under special circumstances be permitted to repeat the failed year. Credit may be given in one or more courses previously taken and passed with a grade of 65 percent or higher (or an equivalent grade point). In such cases the student may be required to register in additional courses not more than one of which may be a course prescribed in a subsequent year of his program.
4. A student permitted to repeat a failed year who fails to produce a satisfactory record in the first-term examinations in the repeated year, will be required to withdraw from the Faculty and will be denied further registration in Engineering.
5. A student who has obtained credit in all of the courses prescribed for him in the second year of a program may be permitted registration in the third year of a different program but, if so, will be required to register in any course prescribed for the second year of the new program in which he does not have credit.
6. A student will be denied further registration in Engineering if after three academic years he has not qualified for registration in the third year of his program.
7. Beginning with the 1966-67 session, the Faculty will be operating on a new marking system described in Part I of the Calendar. The above regulations will be adjusted in conformity with this system.

WEIGHTING OF GRADES

In the computation of student averages for scholarship and other purposes the grades obtained in individual courses are weighted in accordance with weighting factors established by the Faculty.

FIRST YEAR ENGINEERING

All Programs

Number	Subject	Hours per week					
		First Term			Second Term		
		Lect.	Lab.	Sem.	Lect.	Lab.	Sem.
Math. 212	Introductory Calculus	4	2	0	0	0	0
Math. 213	Calculus	0	0	0	4	2	0
Phys. 230	Dynamics, Waves and Optics	3	3/2	2/2	3	3/2	2/2
Chem. 232	Modern Chemistry	3	3	0	3	3	0
D.G. 151	Drafting and Graphics	0	3	0	2	3	0
E.M. 152	Engineering Mechanics (Statics)	2	0	2	0	0	0
E.M. 153	Engineering Mechanics (Applied Statics and Kinematics)	0	0	0	2	0	0
English 250	English	2	0	0	2	0	0
Phys. Ed.	Physical Education	0	2	0	0	2	0
Eng. P. 159	Orientation to Engineering Profession	1	0	0	0	0	0
	Total Hours—	15	11½	3	16	11½	1

SECOND YEAR ENGINEERING

All Programs

Number	Subject	Hours per week					
		First Term			Second Term		
		Lect.	Lab.	Sem.	Lect.	Lab.	Sem.
Ch.E. 267	Engineering Thermodynamics	0	0	0	3	0	1
C.E. 263	Mechanics of Deformable Bodies I	3	3	0	0	0	0
E.E. 254	Fundamentals of Electrical Engineering	0	0	0	3	3/2	0
E.M. 252	Engineering Mechanics (Rigid Body Dynamics)	2	0	0	0	0	0
Math. 312	Linear Algebra	3	0	2	0	0	0
Math. 313	Differential Equations	0	0	0	3	0	2
Met.E. 253	Materials Science	3	0	0	0	0	0
Phys. 330	Electricity and Magnetism	4	3	2/2	0	0	0

Chemical

Ch.E. 265	Engineering Design	0	0	0	3	0	3
Group A	Electives—one of	...	...	...	...	...	...

Civil

Geol. 230	Engineering Geology	0	0	0	3	3	0
C.E. 264	Mechanics of Deformable Bodies II	0	0	0	2	0	0
C.E. 251	Engineering Surveying	0	0	0	2	2	0
C.E. 252	Survey School	Three weeks at end of second term*					

*If the survey school is held at a survey camp, students may be charged room and board.

Mechanical

Number	Subject	Hours per week					
		First Term			Second Term		
		Lect.	Lab.	Sem.	Lect.	Lab.	Sem.
Ch.E. 265	Engineering Design	0	0	0	3	0	3
Group A	Electives—one of	...	...	...	...	...	...

Electrical

Econ. 304	Principles of Economics	0	0	0	3	0	0
Group A	Electives—one of	...	...	...	...	...	...

Metallurgy

Ch.E. 265	Engineering Design	0	0	0	3	0	3
Group A	Electives—one of	...	...	...	...	...	...

Mining

	As for Civil	...	...	...	...	...	...

Group A—Electives

A list of courses approved by the individual departments is available at the time of registration at the department office.

Notes:

1. Students entering third or fourth year with high averages, may, with the consent of the Head of the appropriate Engineering Department, make some substitutions in the regular course pattern.
2. Students with irregular programs must bear in mind that departments may require pre-requisites or co-requisites for certain courses before registration can be approved.

THIRD YEAR — CHEMICAL ENGINEERING

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Ch.E. 312	Transport Phenomena I	2	3/2s	0	0
Ch.E. 314	Transport Phenomena II	0	0	2	3/2s
Ch.E. 365	Industrial Stoichiometry	2	1	0	0
Chem. 352	Organic Chemistry	3	2	3	2
Chem. 472	Physical Chemistry	3	3	3	3
Econ. 303	Principles of Economics	2	0	2	0
Math. 406	Advanced Calculus	3	0	3	0
C.S. 300	Compiler Language Programming	0	0	2	1s
	Total Hours—	15	7½	15	7½

FOURTH YEAR — CHEMICAL ENGINEERING

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Ch.E. 410	Mass Transfer	3	2s	0	0
Ch.E. 414	Fluid Flow and Heat Transfer	0	0	3	2s
Ch.E. 463	Chem. Engr. Laboratory	0	4/2	0	4/2
Ch.E. 464	Applied Reaction Kinetics	3	1s	0	0
Ch.E. 465	Chem. Engr. Project	2	2	1	4
Ch.E. 467	Chem. Engr. Thermodynamics II	0	0	3	1s
Ch.E. 472	Colloquium	0	1	0	1
Ch.E. 494	Industrial Tours	0	0	0	0
Eng.P. 459	Practice of the Engineering Profession	0	0	1	0
Group A	Elective Courses (1, 2)	6	2	6	2
	Total Hours(2)—	14	10	14	12

Notes—:

(1) Selection to be approved by Head of Department of Chemical and Petroleum Engineering.

(2) Hours are approximate depending upon optional courses selected.

Elective Courses

Students are required to select the equivalent of two full courses as electives to complete their program. One of these may be a non-technical elective course selected from a list approved by the Department. The following technical elective patterns may be selected and they have been timetabled to fit in with the regular core courses. In consultation with the Department of Chemical and Petroleum Engineering, other combinations of the above courses or other suitable courses in science and engineering may be selected to complete the pattern.

Chemistry Pattern

Chem. 452	Organic Chemistry	3	0	3	0
Chem. 432	Inorganic Chemistry	3	0	3	0

Mathematics Pattern

Math. 408	Functions of Complex Variables	3	0	0	0
C.S. 458	Numerical Analysis	0	0	2	2
Ch.E. 477	Mathematical Applications	3	0	0	0
Ch.E. 478	Stat. Methods in Chem. Eng.	0	0	3	3/2

Dynamics Pattern

Ch.E. 466	Control Theory	3	0	0	0
Ch.E. 442	Process Dynamics I	0	0	3	3/2
Ch.E. 444	Process Dynamics II	0	0	3	3/2
Ch.E. 477	Mathematical Applications	3	0	0	0

Petroleum Pattern

Pet.E. 482	Reservoir Mechanics I	3	3/2	0	0
Pet.E. 483	Reservoir Mechanics II	0	0	3	3/2
C.S. 458	Numerical Analysis	0	0	2	2
Ch.E. 477	Mathematical Applications	3	0	0	0

Industrial Pattern

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Ch.E. 478	Statistical Methods in Chem. Engr.	0	0	3	3/2
Ch.E. 479	Instrumentation	3	3/2	0	0
Ch.E. 454	Operations Analysis	3	1s	0	0
Ch.E. 474	Optimization Methods	0	0	3	1s

PETROLEUM ENGINEERING

Two courses in Petroleum Reservoir Mechanics are available to students in the senior years of the programs in Chemical and in Mechanical Engineering to enable them better to prepare for careers in the petroleum production industry.

A graduate program leading to the Master of Science degree in Petroleum Engineering is offered and is open to students graduating with Bachelor of Science degrees in any branch of engineering.

THIRD YEAR — CIVIL ENGINEERING

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
C.E. 333	Fluid Mechanics	2	3/2	2	3/2
C.E. 340	Soil Mechanics	0	0	2	0
C.E. 350	Geodesy and Photogrammetry	2	3/2	2	3/2
C.E. 360	Theory of Structures	2	0	2	0
C.E. 362	Elements of Structural Design	2	3	2	3
C.E. 380	Engineering Mechanics	3	0	3	0
E.E. 301	Elements of Electrical Eng.	0	0	2	3/2
Mech.E. 343	Thermodynamics	0	0	3	0
C.S. 300	Compiler Language Programming	1	3	0	0
Geol. 330	Engineering Geology	3	3	0	0
Economics 303	Principles of Economics	2	0	2	0
	Total Hours—	17	12	20	7½

FOURTH YEAR — CIVIL ENGINEERING

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Eng.P. 459	The Practice of the Engineering Profession	0	0	1	0
C.E. 420	Water Supply and Sewerage	2	3/2	2	3/2
C.E. 436	Hydrology and River Engineering	0	0	3	3
C.E. 440	Foundations and Earth Structures	2	0	2	0
C.E. 441	Soil Mechanics Laboratory	0	3	0	3
C.E. 455	Concrete Technology	2	2	0	0
C.E. 459	Prac. Experience or Project	0	0	0	0
C.E. 460	Theory of Structures	2	0	0	0
C.E. 463	Reinforced Concrete Design I	3	3	0	0
Electives from[4]					
	Group A	2	3/2	2	3/2
	Group B	3	0	0	0
	Group C	0	0	3	3
	Group D	0	0	3	0
	Total Hours[1]—	16	11	16	12

Elective Courses Referred to Above(2)(3)

Group A—each student will take

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Either C.E. 410	Highway Engineering	2	3/2	2	3/2
or C.E. 411	Highway Engineering	2	0	2	0
or C.E. 431	Senior Hydraulics Laboratory	0	3/2	0	3/2

Group B—each student will take **one** of

C.E. 422	Sanitary Engineering Laboratory	1	3	0	0
C.E. 426	Town Planning I	2	1s	0	0
C.E. 430	Senior Fluid Mechanics I	3	0	0	0
C.E. 462	Advanced Strength of Materials	3	0	0	0

Group C—each student will take **one** of

C.E. 427	Town Planning II	0	0	2	1s
C.E. 434	Water Power Engineering	0	0	3	3
C.E. 464	Reinforced Concrete Design II	0	0	2	3
Geol. 466	Glacial Geology	0	0	3	3

Group D—each student will take **one** of

C.E. 425	Municipal Engineering	0	0	3	0
C.E. 435	Senior Fluid Mechanics II	0	0	3	0
C.E. 466	Numerical and Approximate Methods of Structural Analysis	0	0	3	0

Notes:—

(1) Hours are approximate and depend on options selected.

(2) Students particularly interested in Structures should register in C.E. 462, C.E. 464 and C.E. 466.

(3) Students particularly interested in Fluid Mechanics should register in C.E. 431, C.E. 430 and C.E. 435.

(4) Each student must choose electives from each of Groups A, B, C and D as indicated.

THIRD YEAR—ELECTRICAL ENGINEERING

Core Courses (all students are required to take these courses)

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
E.E. 314	Electromagnetic Theory	3	0	3	0
E.E. 332	Electromechanical Energy Conversion	2	3/2	2	3/2
E.E. 350	Electric Circuits	2	3/2	2	3/2
E.E. 370	Engineering Electronics	2	3/2	2	3/2
Math. 405	Advanced Calculus	4	0	4	0
	Subtotal Hours—	13	4½	13	4½

Additional Courses
Option I

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Econ. 304*	Principles of Economics	3	0	0	0
Mech.E. 346	Transport Processes	2	1s	2	1s
C.S. 300	Compiler Language Programming	0	0	2	1
	Subtotal Hours—	5	1s	4	2
	Total Hours for Option I—	18	5½	17	6½

*Note: Econ 304 will be deleted from third year next year since all students would have taken this course in their second year.

Option II‡

Physics 510	Thermodynamics and Kinetic Theory	3	0	3	0
Math. 430	Advanced Mechanics	3	0	3	0
	Subtotal Tours—	6	0	6	0
	Total Hours for Option II—	19	4½	10	4½

‡Students who wish to take Option II must have a high standing in Mathematics and Physics and normally will be required to have an average of approximately 75% or equivalent grade point average in their second year. The Head of the Electrical Engineering Department may make an exception to this rule if he considers that a student is otherwise qualified. This option is intended to provide the student with a thorough background in Mathematics and Physics and is designed for those who wish to pursue a program of advanced study and research in areas of electrical engineering which require such a background. Since students taking Option II in 1966-67 will miss the course in Economics in the third year, these students will be urged to take a course in Economics or Business Administration as one of the optional courses in their fourth year.

FOURTH YEAR ELECTRICAL ENGINEERING

Power and Electronic Patterns

Required Courses (All Patterns)

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
E.E. 458	Electrical Laboratories	0	9	0	9
E.E. 460	Feedback Control Systems	3	0	3	0
E.M. 453	Mechanical Vibrations	3	0	0	0
Eng.P. 459	The Practice of the Engineering Profession	0	0	1	0
Math. 408	Functions of Complex Variable	0	0	3	0
Phys. 530	Modern Physics	2	0	2	0
	Subtotal Hours—	8	9	9	9

Additional Courses: Power Pattern

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
E.E. 401	Electrical Design	3	0	0	0
E.E. 421	Electrical Power Transmission	3	0	0	0
E.E. 431	Electrical Machinery	3	0	0	0
Group A	Any three courses [1, 2]	0	0	9	0
	Subtotal Hours[2]—	9	0	9	0
	Total Hours[2]—	17	9	18	9

Additional Courses: Electronics Pattern

E.E. 470	Electronic Circuit Analysis	3	0	3	0
E.E. 491	Guided Waves	3	0	0	0
Group B	Any three courses[1, 2]	0	0	9	0
	Subtotal Hours[2]—	6	0	12	0
	Total Hours[2]—	14	9	21	9

(Optional Courses Applicable As Indicated Above)

Group A

E.E. 407	High Voltage Engineering	0	0	3	0
E.E. 425	Power System Planning	0	0	3	0
E.E. 445	Electrical Instruments and Relays	0	0	3	0
Mech.E. 405	Power Plant Design	0	0	3	0
C.S. 458	Numerical Analysis and Modern Computational Methods	0	0	2	1

Group B

E.E. 475	Generation of High Frequencies	0	0	3	0
E.E. 477	Pulse and Waveshaping Circuits	0	0	3	0
E.E. 479	Switching Circuits and Logical Design	0	0	3	0
E.E. 481	Signal Processing	0	0	3	0
E.E. 483	Introduction to the Physics of Plasmas	0	0	2	0
E.E. 485	Acoustics	0	0	3	0
E.E. 487	Communication Theory	0	0	3	0
E.E. 495	Radiation, Antennas and Propagation	0	0	3	0
E.E. 497	Microwave Measurements	0	0	3	0
E.E. 498	Special Problems I	3	0	0	0
E.E. 499	Special Problems II	0	0	3	0
C.S. 458	Numerical Analysis and Modern Computational Methods	0	0	2	1

Notes:—

(1) Selection to be approved by Head of Department of Electrical Engineering.

(2) Hours are approximate depending upon optional courses selected.

THIRD YEAR — MECHANICAL ENGINEERING

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
E.M. 337	Fluid Mechanics	3	2s	0	0
Econ. 304	Principles of Economics	3	0	0	0
E.E. 304	Electrical Engineering	2	3/2	2	3/2
E.M. 355	Advanced Strength of Materials I	0	0	3	0
Math. 407	Advanced Calculus	3	0	3	0
Mech.E. 301	Mechanical Measurements Laboratory	1	3	1	3
Mech.E. 421	Applied Thermodynamics	0	0	3	0
Mech.E. 361	Machine Components	2	3/2	0	0
Mech.E. 362	Mechanics of Machines	0	0	2	3/2
Met.E. 362	Physical Metallurgy	0	0	3	3
C.S. 300	Compiler Language Programming	2	1s	0	0
	Total Hours—	16	9	17	9

FOURTH YEAR — MECHANICAL ENGINEERING

Required Courses

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
E.M. 452	Mechanical Vibrations	0	0	3	0
E.M. 455	Advanced Strength of Materials II	3	0	0	0
Mech.E. 401	Mechanical Engineering Laboratory	0	3	0	3
Mech.E. 421	Applied Thermodynamics	3	0	0	0
Mech.E. 436	Applied Gas Dynamics	0	0	3	0
Mech.E. 462	Principles of Design	2	3/2	0	3
Mech.E. 470	Heat Transfer I	3	0	0	0
E.E. 469	Feedback Control Systems	0	0	3	3/2
Eng.P. 459	Practice of Engineering Profession	0	0	1	0
	Subtotal Hours—	11	4½	10	7½

Additional Courses: Option I

Select any 2 groups from the following:—

Group*					
A Prod. 310	Production Management	3	0	3	0
B B 250	Admin. Principles and Management	3	0	3	0
C B.L. 310	Business Law	3	0	3	0
D C.E. 434	Water Power Engineering	3	3	0	0
Mech.E. 405	Power Plant Engineering	0	0	3	0
E Pet.E. 482	Reservoir Mechanics I	3	3/2	0	0
Pet.E. 483	Reservoir Mechanics II	0	0	3	3/2
	Subtotal Hours—	6	3	6	0
	Total Hours(1)—	17	7½	16	7½

(1) Hours are approximate depending upon option selected.

*in consultation with the Department of Mechanical Engineering, other suitable courses may be substituted for those shown.

Additional Courses: Option II

Select Group A and any 1 of the remaining groups of courses:

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Group*					
A C.S. 458	Num. Analysis and Comp. Methods	0	0	2	2
Math. 408	Functions of a Complex Variable	3	0	0	0
B Math. 480	Matrices and Cartesian Tensors	3	0	0	0
E.M. 460	Mechanics of Solids	0	0	3	0
C Mech.E. 440	Thermodynamics II	3	0	0	0
Mech.E. 471	Heat Transfer II	0	0	3	0
D Pet.E. 482	Reservoir Mechanics I	3	3/2	0	0
Pet.E. 483	Reservoir Mechanics II	0	0	3	3/2
E C.E. 430	Senior Fluid Mechanics I	3	0	0	0
C.E. 435	Senior Fluid Mechanics II	0	0	3	0
	Subtotal Hours—	6	0	5	2
	Total Hours(1)—	17	4½	15	9½

(1) Hours are approximate depending upon option selected.

*in consultation with the Department of Mechanical Engineering, other suitable courses may be substituted for those shown.

DEPARTMENT OF MINING AND METALLURGY

THIRD YEAR — METALLURGY

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
C.E. 380	Engineering Mechanics	3	0	3	0
Econ. 304	Principles of Economics	3	0	0	0
Ch.E. 312	Transport Phenomena I	2	3/2	0	0
Ch.E. 314	Transport Phenomena II	0	0	2	3/2
Geol. 414	Mineralogy	3	3	0	0
C.S. 300	Compiler Language Programming	0	0	2	1
Chem. 472	Physical Chemistry	3	3	3	3
Met.E. 355	Process Metallurgy I	3	3	0	0
Met.E. 356	Metallurgical Thermodynamics & Kinetics	0	0	3	0
Met.E. 370	Fundamentals of Physical Metallurgy I	0	0	3	3
		17	10½	16	8½

FOURTH YEAR — METALLURGY

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Chem. 432	Inorganic Chemistry	3	0	3	0
Eng.P. 459	Practice of the Engineering Profession	0	0	1	0
E.E. 303	Electronic Instrumentation	2	3/2	0	0
Phys. 416	Introduction to Wave Mechanics	2	0	2	0
Met.E. 404	Practical Experience	0	0	0	0
Met.E. 455	Process Metallurgy II	3	3/2	0	0
Met.E. 456	Process Metallurgy III	0	0	3	3/2
Met.E. 461	Application of Physical Metallurgy	3	0	3	3
Met.E. 465	Research Project	0	3	0	6
Met.E. 470	Fundamentals of Physical Metallurgy II	3	3	0	0
Met.E. 490	Colloquium	0	0	0	1
	Elective	0	0	3	0*
		16	9	15	11½

THIRD YEAR — MINING

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
C.E. 380	Engineering Mechanics	3	0	3	0
Econ. 303	Principles of Economics	2	0	2	0
Ch.E. 312	Transport Phenomena I	2	3/2	0	0
Ch.E. 314	Transport Phenomena II	0	0	2	3/2
Geol. 414	Mineralogy	3	3	0	0
C.S. 300	Compiler Language Programming	2	1	0	0
Met.E. 355	Process Metallurgy I	3	3	0	0
Met.E. 356	Metallurgical Thermodynamics & Kinetics	0	0	3	0
Met.E. 362	Physical Metallurgy	0	0	3	3
M.E. 303	Introduction to Mining	2	3/2	0	0
M.E. 304	Rock Mechanics and Explosives	0	0	2	0
Elec. Eng. 301	Elements of Electrical Engineering	0	0	2	3/2
		17	10	17	6

FOURTH YEAR — MINING

Number	Subject	Hours per week			
		First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
C.E. 362	Elements of Structural Design	2	3	2	3
Eng.P. 459	Practice of the Engineering Profession	0	0	1	0
Geol. 450	Petrography	1	3	0	0
Geol. 460	Metallic Mineral Deposits	0	0	3	3
Geol. 462	Photogeology	1	3	0	0
Met.E. 455	Process Metallurgy II	3	3/2	0	0
Met.E. 456	Process Metallurgy III	0	0	3	3/2
M.E. 400	Mining Methods	3	0	3	0
M.E. 401	Mine Design	0	3	0	6
M.E. 404	Practical Experience	0	0	0	0
M.E. 411	Rock Mechanics Lab.	0	3	0	0
	Elective	3	0	3	0*
		13	16½	15	13½

*Elective to be chosen in consultation with Department—approximately equivalent time will be accepted, according to course.

DETAILS OF COURSES

GENERAL

Eng.P. 159—L. E. Gads and Guest Speakers (1-0; 0-0)

Orientation to the Engineering Profession—An outline of the development and history of the engineering profession; the branches of engineering; the work of the engineer in the various branches.

Eng.P. 459—R. M. Hardy and Guest Speakers (0-0; 1-0)

The Practice of the Engineering Profession—The role of the engineer in society, his technical and professional responsibilities—ethics of the profession; technical and professional associations; the engineer-in-training; the engineer in industry—technical and administrative work; the consulting engineer.

DEPARTMENT OF CHEMICAL AND PETROLEUM ENGINEERING

Ch.E. 265 (0-0; 3-3s)

Engineering Design—The solution of engineering problems, design as a decision making process, establishment of data, conception of alternative solutions. Example problems utilizing background in mathematics, physics, chemistry, mechanics, and thermodynamics. The course includes instruction in computer programming in the Fortran language and the role of the computer in handling complex engineering calculations is illustrated wherever possible.

Chemical Engineering

Ch.E. 267 (0-0; 3-1s)

Engineering Thermodynamics—Definitions, properties of pure materials, work and heat, the first law, the second law, entropy, power and refrigeration cycles, behavior of real gases, thermochemistry.

Textbook: Van Wylen, *Thermodynamics.*

Ch.E. 312 (2-3/2s; 0-0)

Transport Phenomena I—An introduction to the principles of transport phenomena through the derivation and application of the overall and differential mass, energy, and momentum balances. Concepts of fluid behavior; viscosity; laminar and turbulent flow; velocity distributions in laminar flow. Flow measuring devices. Dimensional analysis and design equations for flow in conduits, past immersed objects, and through porous media.

Textbook: Bennett and Myers, *Momentum, Heat, and Mass Transfer.*

Reference: Perry, *Chemical Engineers' Handbook.*

Ch.E. 314 (0-0; 2-3/2s)

Transport Phenomena II—Some limiting and approximate solutions of equations of motion: creeping flow, potential flow, and boundary layer flow. Thermal conductivity and the mechanisms of heat transfer. Design equations for convective heat transfer. Heat exchange equipment. Diffusivity and the mechanisms of mass transport.

Textbook: Bennett and Myers, *Momentum, Heat, and Mass Transfer.*

Reference: Perry, *Chemical Engineers' Handbook.*

Ch.E. 365 (2-1s; 0-0)

Industrial Stoichiometry—A study in the application of the laws of conservation of mass and energy to the processes of the chemical industry. Extensive examples are introduced to illustrate units of measurement, material and energy balances without chemical reaction and material and energy balances in processes where chemical reaction is involved.

Ch.E. 410 (3-2s; 0-0)

Mass Transfer—Mass transfer rate processes including absorption, humidification and drying. Equilibrium stage processes including distillation and extraction.

Textbooks: Perry, *Chemical Engineers' Handbook;* Bennett and Myers, *Momentum, Heat, and Mass Transfer.*

Ch.E. 414 (0-0-; 3-2s)

Fluid Flow and Heat Transfer—Selected topics in fluid mechanics, including compressible flow, high-velocity flow, discussion of turbulence. Heat transfer, including multidimensional transient conduction, a survey of heat transfer coefficient correlations, design of heat exchangers, radiation.

Textbooks: Perry, *Chemical Engineers' Handbook;* Bennett and Myers, *Momentum, Heat, and Mass Transfer.*

Ch.E. 442 (0-0; 3-3/2)

Process Dynamics I—An introduction to analog simulation and the development of mathematical models to describe the dynamic response characteristics of chemical process elements. Reduction of process equations to transfer function notation.

Textbook: Coughanowr and Koppell, *Process Systems Analysis and Control.*

Ch.E. 444 (0-0; 3-3/2)

Process Dynamics II—Mathematical description of chemical process operations in terms of the basic dynamic elements. Development of block diagrams and an introduction to root locus and frequency response methods of stability analysis for linear feedback control systems. A brief discussion of optimization techniques.

Textbook: Coughanowr and Koppell, *Process Systems Analysis and Control.*

Ch.E. 454 (3-1s, 0-0)

Operations Analysis—Economic basis for analysis of large-scale processing systems; general design and operational decisions; examples illustrating modern techniques for solving problems in forecasting, allocation of resources, inventory control, and replacements.

Ch.E. 463 (0-4/2; 0-4/2)

Chemical Engineering Laboratories—A laboratory course designed to illustrate the principal operations of chemical engineering with selected experiments from such fields as unit operations, applied thermodynamics, instrumentation, and applied reaction kinetics.

Corequisite: Ch.E. 461.

Ch.E. 464 (3-1s; 0-0)

Applied Reaction Kinetics—The interpretation of the kinetics of homogeneous and heterogeneous chemical reactions leading to the design of chemical reactor

and related equipment. The principles are illustrated through the solution of practical problems.
Textbook: Levenspiel, *Chemical Reaction Engineering.*

Ch.E. 465 (2-2; 1-4)

Chemical Engineering Design Project—Chemical engineering practice and theory are integrated through assigned problems which emphasize the project approach to engineering. Both the lectures and the problems emphasize the basic economic factors affecting costs, investment and profits and the necessity of exercising engineering judgment in the selection of a suitable design.

Ch.E. 466 (3-0; 0-0)

Control Theory—An introduction to the principles of control theory including feedback concepts, elements of the closed loop, controller functions, controlled system response, and stability concepts.
Textbook: Eckman, *Automatic Process Control*

Ch.E. 467 (0-0; 3-1s)

Chemical Engineering Thermodynamics II—Thermodynamics presented from the engineering viewpoint. Practice is given in the application of thermodynamics as a useful tool in the solution of problems of the process industries and the petroleum production field.
Textbook: Hougen, Watson, Ragatz, *Thermodynamics.*

Ch.E. 472

Colloquium—The colloquium, which meets once a week, is attended by fourth-year students and staff for discussion of topics from recent literature.

Ch.E. 474 (0-0; 3-1s)

Optimization Methods—Search for optimum conditions; by indirect methods including Lagrangian multipliers and mathematical programming; by direct methods including tangent and gradient methods, steep ascent Partan; by dynamic programming; by the maximum principle.
Textbook: Wilde, *Optimum-Seeking Methods.*

Ch.E. 477 (3-0; 0-0)

Mathematical Applications—This course emphasizes the derivation and solution of mathematical models for chemical engineering operations such as heat transfer, diffusion and process control. Mathematical topics covered include ordinary and partial differential equations, series solutions, complex numbers, Laplace transforms, and Sturm Liouville Systems.
Textbook: Jensen and Jeffreys, *Mathematical Methods in Chemical Engineering.*

Ch.E. 478 (0-0; 3-1s)

Statistical Methods in Chemical Engineering—A review of the elementary principles of statistics; the extension and application of statistical methods used by the engineer in analyzing research, development, and production problems.
Textbook: Bowker and Lieberman, *Engineering Statistics.*

Ch.E. 479 (3-3/2; 0-0)

Instrumentation—A study of the basic elements for the measurement and control of process variables; the techniques of instrumenting chemical processes and the response of the controlled process.
Textbook: Eckman, *Automatic Process Control.*

Ch.E. 494

Industrial Tour—The third and fourth year classes, accompanied by staff, inspect and study industrial plants, laboratories and field installations in and near Edmonton. Trips are arranged periodically throughout the year.

Graduate Courses—

Ch.E. 561 (3-0; 0-0)

Advanced Heat Transfer—A study of the major analytical and experimental results applicable to design problems which involve heat transfer by conduction, convection, or radiation.

Textbook: Grober, Erk, and Grigull, *Fundamentals of Heat Transfer.*

Ch.E. 562 (0-0; 3-0)

Advanced Mass Transfer Operations—A review of the fundamentals of mass transfer processes and the applications of these fundamentals to the design of various separation processes. Topics to be discussed will include molecular diffusion, diffusion in turbulent flow, interphase mass transfer, absorption, simultaneous heat and mass transfer, absorption with chemical reaction, liquid-liquid extraction, multi-component distillation and absorption and tray efficiencies.

Ch.E. 564 (3-0; 0-0)

Applied Kinetics and Catalysis—Design of homogeneous and heterogeneous reactors for isothermal and non-isothermal operation. Correlation of rate data, selectivity, non-ideal flow, heterogeneous catalysis, transport processes ln heterogeneous reactors and polymer kinetics.

Textbook: Levenspiel, *Chemical Reaction Engineering.*

Ch.E. 566 (3-0; 0-0)

Process Control—An analysis of non-linear and sampled data control systems with an introduction to computer control and optimization.

References: Recent technical literature.

Ch.E. 567 (3-0; 0-0)

Advanced Thermodynamics—Advanced applications of thermodynamics to industrial problems; the estimation of thermodynamic properties, feasibility of chemical reactions and other selected topics.

References: Recent technical literature.

Ch.E. 568 (3-0; 0-0)

Selected Topics in Fluid Mechanics—Basic equations of fluid mechanics and their application to flow problems in chemical engineering. Discussion of Non-Newtonian fluids, multi-phase flows, Stokes' law, perfect theory, boundary layer theory, and modern concepts of turbulence.

References: Schlichting, *Boundary Layer Theory;* recent technical literature.

Ch.E. 574 (0-0; 3-0)

Numerical Solutions of Engineering Problems—The structural features of certain classes of multi-dimensional variational problems are analyzed. Topics include the formulation of approximating functions, the numerical solution of certain partial differential equations, linear programming, dynamic programming, and optimization. A basic knowledge of numerical techniques and of computer programming is a prerequisite.

Ch.E. 572 (1-0; 1-0)

Graduate Seminar—Meetings of graduate students and staff are held periodically throughout the year for discussion of progress and problems in research underway in the Department.

Ch.E. 577 (3-0; 0-0)

Mathematical Applications—The lectures of Ch.E. 477 with additional assignments for graduate students.

Ch.E. 578 (0-0; 3-0)

Advanced Mathematical Applications II—Application of mathematics to engineering problems with emphasis on implicit function theory, least square techniques, and vector and tensor analysis. Problems in thermodynamics, curve fitting, hydrodynamics, behavior of materials.
Text: To be announced.

Ch.E. 595 (0-0; 3-0)

Advanced Topics in Chemical Engineering—An advanced treatment of selected chemical engineering topics of current interest to staff and students.

Petroleum Engineering

Pet.E. 482 (3-3/2; 0-0)

Reservoir Mechanics I—A fundamental treatment of the reservoir rock properties, fluid properties, phase behavior of reservoir fluids and the basis concepts of fluid flow in porous media.
Textbook: Pirson, *Elements of Reservoir Engineering.*

Pet.E. 483 (0-0; 3-3/2)

Reservoir Mechanics II—The application of the physical principles of reservoir mechanics to reservoir engineering. The analysis of reservoir performance.
Textbook: Craft and Hawkins, *Applied Petroleum Reservoir Engineering.*

Pet.E. 580 (0-0; 3-0)

Physical Properties and Behavior of Petroleum Fluids—An advanced treatment of the phase behavior of single and multicomponent hydrocarbon and hydrocarbon—non-hydrocarbon systems; hydrocarbon—water systems and hydrate formation; the prediction of critical properties, volumetric behavior, and the transport properties; vapor-liquid equilibrium and the prediction of equilibrium ratios.
References: Sage and Lacey, *Volumetric and Phase Behavior of Hydrocarbons;* Recent technical literature.

Pet.E. 583 (3-0; 0-0)

The Mechanics of Fluid Flow in Porous Media—An advanced treatment of the physical properties of porous media, with special attention to single-phase and multi-phase fluid flow.
Textbook: Scheidegger, *The Physics of Flow through Porous Media.*

Pet.E. 584 (0-0; 3-0)

Secondary Recovery—An advanced study of partial pressure maintenance and full pressure maintenance utilizing the fractional flow equation and frontal advance rate equation.
Textbook: A.P.I., *Secondary Recovery of Oil in the United States.*

Pet.E. 585 (3-0; 0-0)

Fluid Mechanics of Natural Gas Production—Static columns; steady, single and multiphase flow in circular conduits; steady and transient single phase flow in porous media; well and field interference.

Pet.E. 592 (1-0; 1-0)

Graduate Seminar—Course description as for Ch.E. 572.

Pet.E. 595 (0-0; 3-0)

Advanced Topics in Petroleum Engineering—An advanced treatment of selected petroleum engineering topics of current interest to staff and students.

Research

Facilities are available for graduate research in fundamental problems in both chemical and petroleum engineering. Particulars may be obtained from the Department and by reference to the Calendar of the Faculty of Graduate Studies.

DEPARTMENT OF CIVIL ENGINEERING

C.E. 251 (0-0; 2-2)

Engineering Surveying—Theory and practice of plane Surveying including construction, use and care of instruments. Elements of the theory of errors as applied to measurements. Laboratory exercises include adjustment of instruments, certain field operations and methods of computation and adjustments of traverses, areas and volumes.

C.E. 252 (3 weeks at end of 2nd term)

Survey School—Practical exercises in field methods based on project type assignments. Introduction to Astronomic observations and the use of electronic distance measuring instruments.
Daily lectures during Survey School.

C.E. 263 (3-3; 0-0)

Mechanics of Deformable Bodies I—Normal stress and shearing stress; Mohr's circle for stress; normal strain and shearing strain; stress-strain relationships; axially loaded members, shearing force and bending moments; stresses in beams; beam deflections; torsion of circular sections; combined stresses; buckling of columns; statically indeterminate beams.
Laboratory demonstrations are used to illustrate the behaviour of engineering materials when subjected to load. Mechanical properties are determined from tests such as tension, compression, bending, twisting, hardness, impact, fatigue, creep and buckling.

C.E. 264 (0-0; 2-0)

Mechanics of Deformable Bodies II—Combined stresses and combined strains, strain rosettes; strain energy; simple theories of failure; stress concentrations, fatigue, creep and relaxation, impact loads; built-up beams, shear flow, shear center; shearing force and bending moment.

C.E. 333 (2-3/2; 2-3/2)

Fluid Mechanics—Fundamental principles of fluid mechanics.
Laboratory exercises in hydraulics, including experiments on small orifices,

weirs and notches, flow through pipes, impact of jets, and tests of hydraulic machines, etc.

C.E. 340 (0-0; 2-0)

Soil Mechanics—Fundamental principles of soil mechanics, including origin, classification and structure of soils; clay mineralogy; soil moisture, capillarity, permeability and consolidation; simple soil tests and classification tests; shearing resistance of soils; subsurface investigations.

C.E. 350 (2-3/2; 2-3/2)

Geodesy and Photogrammetry—Shape of the earth and geodetic methods; field astronomy; cartography; photogrammetry and photo interpretation and analysis; newer survey instruments. Laboratory to include geodetic computations, astro observations for position and azimuth, map projections, photo interpretations; demonstration of photogrammetric equipment and tellurometer.

C.E. 360 (2-0; 2-0)

Theory of Structures—Statically determinate structures, influence lines, stress analysis under static and moving loads, deflections by analytical and graphical methods. Introduction to statically indeterminate structures; computations for slopes and deflections and application to consistent deformation; moment distribution for continuous beams.

C.E. 362 (2-3; 2-3)

Structural Design—Codes and specifications. Theory and design of steel structures for riveted, bolted and welded fabrication; plate girders; trusses. Theory and design of timber structures including glued laminated members and timber connections. Design problems including detailing and preparation of working drawings, are carried out in the laboratory.

C.E. 380 (3-0; 3-0)

Engineering Applications of Differential Equations and Statistics—Basic principles of statistics, probability, significance tests and regression analysis. Solution of ordinary differential equations. Power series, Fourier series and Laplace transforms. Partial differential equations. Complex variables, vector analysis and matrix analysis. The above content is presented with numerous examples of application to engineering problems.

C.E. 410 (2-3/2; 2-3/2)

Highway Engineering—Early roads, traffic planning, highway economics, geometric design; drainage, earthwork, compaction; soil stabilization, frost action, design of bituminous mixes and properties of bituminous materials.

C.E. 411 (2-0; 2-0)

Highway Engineering—Early roads, traffic planning, highway economics, geometric design; drainage, earthwork, compaction; soil stabilization, frost action, design of sub-base, base course and pavement both flexible and rigid; design of bituminous mixes and properties of bituminous materials.

C.E. 420 (2-3/2; 2-3/2)

Water Supply and Sewerage—Quantity, quality and pressure requirements; collection and intake works, water purification and treatment, design of water

treatment plants, design and hydraulics of distribution systems. Separate and combined sewers, storm drains, pipe layout, estimates; methods of sewage treatment and plant design.

C.E. 422 (1-3; 0-0)

Sanitary Engineering Laboratory—A laboratory course to include tests on water and sewage, common control tests for water and sewage treatment, use of instruments and interpretation of results.

C.E. 425 (0-0; 3-0)

Municipal Engineering—Lectures covering fundamentals of topics related to municipal engineering including administration, economics, surveys, record, utilities, street geometrics, traffic planning, traffic control and air pollution.

C.E. 426 (2-1s; 0-0)

Town Planning I—Lectures and seminars covering fundamentals of topics related to Town Planning including: Historical growth and development of cities, growth and decay, population studies, urban land economics, land use and land planning, parks and playgrounds, public services.

C.E. 427 (0-0; 2-1s)

Town Planning II—A continuation of Town Planning I. Planning legislation, regional and city planning, zoning, subdivision design, commercial areas, downtown planning.

C.E. 430 (3-0; 0-0)

Senior Fluid Mechanics I—Properties of fluids. Ideal fluid. Velocity and acceleration in cartesian and cylindrical systems. Continuity equation, stream functions, circulation, vorticity, velocity potential and flow net. Euler's equations of motion, Bernoulli equation and energy considerations. Standard flow patterns and combinations in two and three dimensions. Complex potential and conformal transformation.

C.E. 431 (0-3/2; 0-3/2)

Senior Hydraulics Laboratory—Choice from among a variety of experiments and related problems aimed mainly at demonstrating the behaviour of real fluids in engineering situations; model use and interpretation is included. Facilities are available for studying fundamental fluid behaviour.

C.E. 434 (0-0; 3-3)

Water Power Engineering—Use of water; principles of designing hydro-electric installations; principles of designing and testing of pumps and turbines; graphics of water hammer and surge; accessory equipment; economics; design and use of fans.

C.E. 435 (0-0; 3-0)

Senior Fluid Mechanics II—Navier-Stokes equations. Creeping motion. Boundary layer concept, Prandtl's equations and laminar boundary layers. Karman's momentum equation. Turbulent flow, phenomenological theories and introduction to statistical theory. Turbulent boundary layers and pipe flow. Free turbulent flows. Dimensional analysis. Introduction to compressible flow and its parallel treatment with open channel flows.

C.E. 436 (0-0; 3-3)

Hydrology and River Engineering—The cycle of water occurrence in nature and its relation to hydraulic engineering. Frequency analysis, unitgraph methods, flood routing and other studies of hydrologic data. River behaviour, theory, man's interference with rivers, river control structures, river training works, sediment transport.

C.E. 440 (2-0; 2-0)

Foundations and Earth Structures—Theories of plastic and elastic equilibrium, consolidation, shear strength, earth pressure and seepage. Application of theory to natural and artificial deposits of soil in the selection and design of shallow and deep foundations, retaining structures, earth dams and embankments, and the analysis of slope stability.

C.E. 441 (0-3; 0-3)

Soil Mechanics Laboratory—Laboratory testing to determine the engineering properties of soil; problems in design and behaviour of building foundations, problems concerning stability of earth slopes, sketching and use of flow nets.

C.E. 455 (2-2; 0-0)

Concrete Technology—Properties of portland cement, aggregates and mixing water. Hydration and nature of hydration products. Relation of material properties to properties of fresh and hardened concrete. The nature of strength, elasticity, creep, volume change and durability. Tests and their significance.

C.E. 459 (no designated time)

Practical Experience or Project Assignment—Requirements for this course may be met one of three ways:—

(a) The student may find suitable employment and gain practical experience in Civil Engineering for a period of at least one summer vacation after completion of second year and before entering fourth year. A draft "Report on Practical Experience" must be prepared and submitted not later than December 1 of the fourth year. The final report must be submitted by February 15th.

or—

(b) Students finding difficulty in securing suitable employment are required to inform the Department not later than May 15 of the summer preceding registration for fourth year, at which time a library project may be assigned. A draft report on this work must be submitted not later than December 1 of the fourth year. The final report must be submitted by February 15th.

or—

(c) In certain special cases students of good academic standing may be permitted to carry out a research project in the fourth year under the direction of a staff member.

C.E. 460 (2-0; 0-0)

Theory of Structures—Statically indeterminate structures; analysis of continuous girders and frames using method of work, moment distribution, slope deflection, and column analogy. Anlaysis of bents for sidesway.

C.E. 462 (3-0; 0-0)

Advanced Strength of Materials—States of stress and strain, theories of failure. Shear centers, unsymmetrical bending, curved beams, inelastic bending. Torsion of non-circular sections. Bending of plates. Elastic and inelastic buckling of columns. Buckling of flat plates, lateral buckling of beams. Membrane stresses.

C.E. 463 (3-3; 0-0)

Reinforced Concrete Design I—Working stress and ultimate strength design theory. One-way slabs, beams, girders. Tied and spiral columns under axial loading. Eccentrically loaded columns. Long columns. Footings. Two-way slabs and flat slabs.

C.E. 464 (0-0; 2-3)

Reinforced Concrete Design II—Deflections. Haunched beams, rigid frames, arches, bridges. Principles of linear pre-stressing, design of prestressed slabs and beams.

C.E. 466 (0-0; 3-0)

Numerical and Approximate Methods of Structural Analysis—Methods of successive approximations and numerical procedure for the solution of moments and deflections of beams, beam columns and frames; influence coefficients and influence lines for beams, buckling of columns and beam columns; free vibrations; finite difference method for beams; introduction to matrix analysis of structures.

Graduate Courses—

C.E. 510 (3-0; 0-0)

Pavement Design—Theories and principles of flexible and rigid pavement design and construction control. Pavement performance and evaluation.

C.E. 511 (0-0; 2-2)

Highway Materials—Source, manufacture, properties, tests and specifications of bituminous materials. Properties and testing of aggregates, bituminous and other stabilized mixtures. Current research developments.

C.E. 512 (3-0; 0-0)

Transportation Engineering I—Introduction to all modes of transportation, characteristics of vehicles, road users, traffic flow, speed, etc. Geometric design of highways, intersections and interchanges.

C.E. 513 (0-0; 3-0)

Transportation Engineering II—Traffic engineering and control. Parking studies and design, mathematical transportation models. Seminars on transportation, traffic and design problems.

C.E. 520 (3-0; 3-0)

Sanitary Engineering—Hydraulic analysis of networks, detailed theory and design of processes for water treatment and waste disposal for municipalities and industry. Water pollution indices, stream classification. Air pollution evaluation, sources, methods of control, relation of atmospheric conditions to their dispersal.

C.E. 522 (0-0; 2-4)

Water and Waste Treatment—Theoretical and analytical methods for the chemical, biochemical, and biological examination of water and wastes, with emphasis on their interpretation and significance.

C.E. 530 (3-0; 3-0)

Advanced Fluid Mechanics—Hydrostatics. Potential fields and their flow lines. Flow nets. Vorticity. Continuity equation. Differentiation with respect to time. Frictionless equations of motion and of energy. Physical aspect of energy equation and its practical extensions to friction, turbulence and mean velocity in a section. Rotating axes. Unsteady analysis. Friction factor in uniform pipes. Equation of motion with friction; stress representation; Navier-Stokes equation. Turbulence. Velocity distribution in uniform pipes and relation to flow formulas. Boundary layers.

C.E. 531 (3-0; 0-0)

Engineering Aspects of Ground Water Hydrology—Darcy's Law. Permeability. Equations for flow of a compressible liquid through compressible porous media under unsteady conditions. Equilibrium and non-equilibrium well pumping equations. Well testing. Waterlogging. Other selected topics.

C.E. 532 (0-0; 3-0)

Surface Water Hydrology—Precipitation. Snow and snow melt. Stream gaging. Unit hydrograph theory. Evaporation. Channel and reservoir routing. Base flow. Statistical analysis. Other selected topics.

C.E. 533 (0-0; 3-0)or(3-0; 0-0)

River Engineering I—Outline of geomorphology of rivers. River channel processes. Hydraulic resistance of natural channels. Theories of bed stability, channel self-adjustment, and sediment trasnport. Concepts of river regime. Methods of river survey and analysis. River stabilization and other engineering works. Scour and other common problems.

C.E. 534 (3-0; 0-0)or(0-0; 3-0)

River Engineering II—Treatment of quantitative problems of mobile-bed rivers from approach of regime theory. Outline of engineering problems; quantitative facts of river self-adjustment; development of theory from canal observations; applications to steady and unsteady canals; approximate applications to rivers regarded as canals allowed to meander and subjected to wide ranges of discharge and sediment size and load; elementary model theory. Sediment diversion. Illustrations from case histories.

C.E. 535 (3-0; 0-0)

Open Channel Flow I—Euler's equations, continuity equation, conjugate depths and location of the hydraulic jump for rectangular and non-rectangular sections. Energy of flow, critical conditions, gradually varied flow.

C.E. 536 (0-0;3-0)

Open Channel Flow II—Wave celerity, oscillatory wave, wave routing by analytical and graphical means, for friction, bedslope and changes in cross section. Surge waves.

C.E. 539 (2-2; 0-0)

Hydraulics of Earth Dams and Related Structures—Hydrology, analysis of reservoirs, ground water flow, spillways, cofferdams, ice problems, diversion works; application to design of earth and rock-fill dams and embankments.

C.E. 540 (3-0; 3-0)

Soil Mechanics and Foundations—Theories of plastic and elastic equilibrium, arching, stress-deformation, shear strength, consolidation, earth pressure; application of the theory and principles to selection and design of foundations, retaining structures, anchored bulkheads, cofferdams, tunnels, culverts, bracing of open cuts.

C.E. 541 (2-3; 2-3)

Soil Properties and Testing Methods—Subsurface exploration, physico-chemical aspects, index and control tests, stress-deformation and consolidation characteristics and tests, hydraulic properties. Character of natural deposits.

C.E. 542 (0-0; 3-0)

Advanced Soil Mechanics Problems—A case history method of approach to problems involving the application of the principles of soil mechanics in engineering practice, including the design and analysis of foundations, settlement, stability of slopes, earth dams and embankments, retaining walls, drainage and flow of water through soils.

C.E. 543 (3-0; 0-0)

Foundation Engineering—(Designed primarily for students majoring in the field of Structures.)

Theories of consolidation, stress-deformation and shear strength characteristics, plastic equilibrium, earth pressures, stress distribution; character of natural deposits; the application of the theories and principles to the selection and design of foundations, buried structures and retaining walls.

C.E. 544 (0-0; 3-0)

Earth and Rock-Fill Dams—Stability of slopes, seepage control, earthquake considerations, settlement, mechanism of failures, character of natural deposits, instrumentation, site selection; application to design and construction of earth and rock-fill dams and embankments.

C.E. 555 (3-0; 0-0) or (0-0; 3-0)

Cement and Concrete Technology—Properties of concrete with emphasis on the physico-chemical aspects of behaviour. Topics covered include workability, strength, elasticity, creep, fatigue, volume change, durability, permeability, fire resistance, admixtures and concrete for radiation shielding.

C.E. 561 (0-0; 3-0)

Plastic Analysis and Design of Structures—Basic assumptions and hypotheses. Limit analysis of beams and frames. Determination of deflections in plastic beams and frames. Repeated loading and shakedown. Plastic analysis of members under combined stress.

C.E. 562 (3-0; 0-0)

Behaviour and Design of Steel Structures—Structural research and theory and their relationship to current specifications and design procedures. Riveted,

bolted and welded connections; columns; flexural members; frames. Light gauge construction.

C.E. 563 (3-0; 0-0)

Behaviour and Design of Reinforced Concrete Members—Strengths and behaviour of simple reinforced concrete members. Relation between results of research and current design specifications. Members subjected to flexure, axial compression, combined flexure and axial load, combined flexure and shear, torsion.

C.E. 564 (0-0; 3-0)

Behaviour and Design of Reinforced Concrete Structures—Strength and behaviour of indeterminate reinforced concrete structures. Load factors. Elastic and limit analysis of continuous beams and frames. Behaviour and design of floor slabs and footings. Stability of reinforced columns, beams and frames.

C.E. 565 (0-0; 3-0)

Behaviour and Design of Prestressed Concrete Structures—Elastic analysis, design and behaviour of simply supported and continuous prestressed concrete beams, frames and slabs. Methods of prestressing; prestress losses; anchorage zone stresses. Discussion of current design specifications.

C.E. 571 3-0; 0-0)

Indeterminate Structural Analysis—A study of determinacy and stability criteria. Developments of classical methods for determining the deformations of statically determinate structures and the analysis of statically indeterminate structures, with emphasis on the similarities, differences and restrictions of these methods. Application of these methods to indeterminate trusses, multi-storey frames, Vierendeel trusses, gable frames, etc.

C.E. 572 (0-0; 3-0)

Advanced Structural Analysis—Analysis of multi-storey, multi-panel building frames. Effects of axial loads on methods of analysis; stability of frames; secondary stresses in trusses; analysis and stability using matrixes, beam-columns; finite difference equations, use of mathematical analogues in analysis.

C.E. 573 (0-0; 3-0)

Analysis and Design of Roof Shells—A consideration of the assumptions made and limitations of existing shell theories. An examination of the literature for recommendations and modifications of theory when required. Emphasis placed on design of the following shell types, folded plates; shells of revolution, domes, cylindrical vaults; shells of double curvature, hyperbolic paraboloids, elliptic paraboloids.

D.G. 151 (0-3; 2-3)

Drafting and Graphics—Freehand and instrumental drawing; pictorials and multiviews of simple bodies; theory of projection and revolution; introduction to descriptive geometry; conventional practices; elementary exercises.

DEPARTMENT OF ELECTRICAL ENGINEERING

E.E. 254 (0-0; 3-2/2)

Fundamentals of Electrical Engineering—Physical concepts of resistance, inductance and capacitance. Kirchhoff's laws and circuit equations of d-c

networks. Magnetic circuits. Energy concepts. Time domain analysis of R-L, R-C and R-L-C networks. Complex numbers and Phasor Algebra. Impedance concept. Power Factor. Resonance. Three phase circuits. Network theorems. Measuring instruments. Vacuum tube and transistor.

E.E. 301 (For Civil and Mining Engineers) (0-0; 2-3/2)

Elements of Electrical Engineering—Polyphase A.C. circuits, power transmission and distribution transformers, A.C. and D.C. motors, principles of operation, characteristics, electronic instrumentation; control systems.

E.E. 303 (2-3/2; 0-0)

Electronic Instrumentation (For Chemical Engineers)—Fundamentals of Electronics; amplification, oscillation, modulation applied to measuring instruments; methods of measuring non-electrical quantities. Use of measured quantities in control systems. The laboratory will illustrate the uses and limitations of typical instruments.

E.E. 304 (For Mechanical Engineers) (2-3/2; 2-3/2)

Laplace Transforms and applications to networks; Complex frequency; Transfer functions; Concept of feedback; Frequency response; Bode plots; Signal Flow graphs; Electronics; Vacuum tubes and transistors; small signal analysis; Amplifiers; Oscillators; Electronic Instruments; Principles of Electromechanical Energy Conversion; Introduction to transformers and rotating machines.

E.E. 314 (3-0; 3-0)

Electromagnetic Theory—Vector treatment of electric and magnetic fields including a macroscopic treatment of magnetic materials and dielectrics. Maxwell's Equations, waves in homogeneous isotropic media, reflection and refraction of waves. The electromagnetic potentials and the classical theory of radiation.

E.E. 332 (2-3/2; 2-3/2)

Electromechanical Energy Conversion—Principles of electromechanical energy conversion, energy balance and principle of virtual displacement. Audio, impulse and power transformers. D'Alembert's principle—applications to translational and rotational electromechanical transducers. Torque and voltage in rotating energy convertors. Rotating magnetic fields. Concept of the Generalized Machine. Behaviour of the idealized d-c machine. Commutation. Metadyne, Amplidyne. Applications of d-c machines in control systems. Steady state and transient analysis of induction machines—single phase, two phase and three phase induction motors. Synchros.

E.E. 350 (2-3/2; 2-3/2)

Electricial Circuits—Linear and non-linear network elements; Fourier series; Fourier transform; Laplace transform; Complex frequency plane; Impedance and admittance functions; Two-port networks and network functions; Distortion; Attenuation and filters; Active Circuits. Signal flow graphs.

E.E. 370 (2-3/2; 2-3/2)

Engineering Electronics—The analysis and design of solid state and vacuum tube circuits. Linear and non-linear active circuits. Incremental linear models,

the Bode plot, frequency characteristics. Introduction to high frequency devices and techniques.
Textbook: Angelo, *Electronic Circuits,* Second Edition, McGraw-Hill.

E.E. 401 (3-0; 0-0)
Electrical Design—Electrical Design starting from fundamental physics using engineering methods.

E.E. 407 (0-0; 3-0)
High Voltage Engineering—High Voltage Phenomena on Transmission Lines, Dielectric Phenomena, A.C. Testing, Impulse Testing and Rating, Grounding, Circuit Breaking.

E.E. 421 (3-0; 0-0)
Electrical Power Transmission—Transmission Circuit Constants. G. M. D. Methods, AC Power Transmission and Power Diagrams, Line compensation, Fault Conditions with Asymmetry, DC Transmission.

E.E. 425 (0-0; 3-0)
Power System Planning—The Power system, Planning, Continuity of Supply, Operation, Economics, The System Analyser and its operation. Other methods of system analysis.

E.E. 431 (3-0; 0-0)
Electrical Machinery—Electrical machinery: D.C. Machines, Power rectifying equipment, A.C. commutator machines and a more detailed study of selected topics from E.E. 332.

E.E. 445 (0-0; 3-0)
Electrical Instruments and Relays—A study of modern A.C. instruments, relays, and relaying.

E.E. 460 (3-0; 3-0)
Feedback Control Systems—Linear models, response to impulse and step signals, flow graphs, transfer functions, state variables and transition equations, root locus diagrams, stability, frequency response methods, compensation, introduction to nonlinear and sampled data systems.

E.E. 469 (For Mechanical Engineers) (0-0; 3-3/2)
Feedback Control Systems—Linear models of electrical, mechanical, hydraulic and electromechanical components used in control systems. Block diagrams. Signal Flow Graphs. Transfer functions. Time domain analysis of control systems. Root locus diagrams. Frequency response. Stability considerations. Compensation of control systems.

E.E. 470 (3-0; 3-0)
Electronic Circuit Analysis—The analysis and synthesis of linear active devices. Application of two port theory to low, high and band pass amplifiers, using vacuum tubes, junction and field effect transistors. Feedback amplifiers and oscillators. Direct coupled and differentional amplifiers, temperature and

stability effects. Voltage regulators. Two port stability and power gain considerations.
Textbook: Cote and Oakes, *Linear Vacuum Tube and Transistor Circuits* (McGraw-Hill)

E.E. 475 (0-0; 3-0)

Generation of High Frequencies—Triodes at high frequencies, Klystrons, Travelling wave tubes, Magnetrons, Backward wave oscillators, parametric amplifiers, and masers.

E.E. 477 (0-0; 3-0)

Pulse and Waveshaping Circuits—Waveshaping circuits using passive elements, diodes, active devices; pulse generating circuits, mainly multivibrators and blocking oscillators; generation of linear voltage sweeps; other topics such as counting circuits, gating circuits, applications to computers, etc.

E.E. 479 (0-0; 3-0)

Switching Circuits and Logical Design—The development and interpretation of switching circuit algebra and its application in analysis and synthesis of combinational switching circuits; Procedures for minimization of switching circuits and realization of switching functions using relays, tubes, solid state devices and magnetic components. Types of codes and code conversion. Sequential switching circuits and secondary assignment method.

E.E. 481 (0-0; 3-0)

Signal Processing—Analysis, transmission and filtering of signals. Fourier Series and Fourier Transforms. Correlation functions. Spectral density and energy spectra of signals. Analysis of ideal filters. Random variables in linear systems. Detection of signal in the presence of noise. Noise calculations. Modulation.

E.E. 483 (0-0; 2-0)

Introduction to the Physics of Plasmas—Behaviour of plasmas. The Debye Hückel theory. Motion of charged particles in Electromagnetic fields. Magnetohydrodynamics. Dynamic pinch. Two-fluid model. Plasma instabilities.

E.E. 485 (0-0; 3-0)

Acoustics—General laws; impedance; transducers; enclosures; room acoustics, etc.

E.E. 487 (0-0; 3-0)

Communication Theory—This covers the principles of communication theory for students interested in communication and in the presentation of data to modern signalling systems.

E.E. 491 (3-0; 0-0)

Guided Waves—Electromagnetic and Nonelectromagnetic Traveling and standing waves, transmission lines, impedance charts and matching, plane waves, waveguides, cavity resonators, applications.

E.E. 495 (0-0; 3-0)

Radiation, Antennas and Propagation—Radiation, Antennas, Antenna Arrays, Antenna Practice, Aperture Antennas, Ground Wave Propagation, Sky Wave Propagation.

E.E. 497 (0-0; 3-0)

Microwave Measurements—Theory and techniques for the measurement of wavelength and frequency, impedance, attenuation, Q-factor, power receiver, transmitter and aerial characteristics, properties of materials.

E.E. 498 (3-0; 0-0)

Special Problems I

E.E. 499 (0-0; 3-0)

Special Problems II—Courses E.E. 498 and 499 are intended to enable individual or a small group of students to study topics in their particular field of interest under the supervision of a member of the Faculty.

Graduate Courses—

E.E. 501 (2-0; 0-0)

Special Topics in Electrical Engineering I

E.E. 502 (0-0; 2-0)

Special Topics in Electrical Engineering II—Courses E.E. 501 and 502 are intended to enable individual students to study topics in their particular field of interest under the supervision of a member of the Faculty.

E.E. 521 (2-3; 2-3)

Modern Power System Problems—The theory and methods for the analysis of modern power system problems with system studies on the Network Analyzer, Analog and Digital computers.

E.E. 530 (2-3; 2-3)

Solid State Circuit Design—Design of circuits using modern transistors, diodes, silicon controlled rectifiers, and associated devices. Topics will include: stability, a.c., d.c. and thermal; a.c. and d.c. amplifiers, switching circuits, regulators, tuned amplifiers and oscllators, noise. Design philosophy and economics.

E.E. 541 (3-3/2; 0-0)

High Vacuum Technology—Gas Kinetics: Gas Flow; Pumping Speed Theory and System Design Pumping Methods and Pressure Measurement for High and Ultra-High Vacuum; Fabrication and Leak Detection Techniques; Adsorption and Desorption Processes; Vacuum Deposition Techniques; Growth, Structure and Properties of Thin Films.

E.E. 550 (3-0; 3-0)

Network Analysis and Synthesis—Fundamentals of network theory including applications of matrix theory, integral transforms and network topology. A study of methods for the synthesis of passive networks for prescribed driving-point or transfer characteristics. Introduction to active network synthesis.

E.E. 562 (2-3; 2-3)

Sampled-Data Control Systems—Sampling and quantizing; frequency domain analysis, z-transformation; system analysis, transient behaviour and stability, compensation techniques, synthesis, digital compensation. Tsypkin's stability criterion.

E.E. 563 (2-3; 2-3)

Nonlinear Control Systems—Analytical methods; quasi linearisation; describing functions (sinusoidal and random input), phase plane method; relay servomechanisms, stability criteria, compensation techniques, analog simulation. Lyapunov method. Popov criterion.

E.E. 564 (2-2; 2-2)

Optimum Control Systems—Formulation of the optimization problem. Controllability, observability, performance indices, stability. Design of stable optimum controls by Lyapunov's second method. Calculus of variations and optimal control—classical approach, Potryagin's maximum principle, Bellman's principle of optimality. Adaptive control. Other selected topics as time permits.

E.E. 579 (3-0; 0-0)

Logical Design of Digital Computers—A continuation of E.E. 479. Topics to include NAND NOR logic, digital computer memories, computer arithmetic units and control units.

E.E. 580 (2-0; 2-0)

Microwave Measurements and Techniques—Microwave systems, waveguide and coaxial devices. Measurement of power, frequency and impedance; determination of Q (static and dynamic methods). Directional couplers, the Bethe Theory and other representations. Determination of the microwave properties of materials: low loss gases. Water, deterioration of oils, high and low loss ceramics, particle loaded dielectrics. Transmitter and receiver measurements.

High power C.W. tubes and components; systems and measuring techniques. Effects of U.H.F. fields on mammals, fungus, insects. Applications. Microwave properties of water, wood and foods. Low millimetre wave techniques (selected topics).

E.E. 591 (3-0; 3-0)

Electromagnetic Engineering—Fundamental Electromagnetic Theory with applications to transmission lines, wave guides and antennas.

E.E. 592 (3-0; 3-0)

Waves in Plasma—Basic equations and laws, classification of waves and plasmas, transverse, longitudinal and magneto-hydrodynamic waves, coupling of plasmas and radiation.

E.E. 593 (2-0; 2-0)

Elements of Plasma Theory—The theoretical background for investigating plasmas will be developed from Kinetic theory. Topics to be treated are Saha's equation, Debye potential, Liouville's equation, the BBGKY Kinetic theory, the moment equations including magnetohydroynamic problems, the Vlassov theory with examination of plasma oscilaltions and Landau damping.

DEPARTMENT OF MECHANICAL ENGINEERING

E.M. 152 (2-2s; 0-0)

Engineering Mechanics (Statics)—Vector algebra; forces, moments, couples; equivalent force systems; equilibrium; friction.

Textbook: Beer and Johnson, *Vector Mechanics for Engineers* (McGraw-Hill)

E.M. 153 (0-0; 2-0)

Engineering Mechanics (Applied Statics and Kinematics)—Stresses in pin jointed trusses;virtual work; area and mass moments of inertia; kinematics of rigid body motion.

Textbook: Same as for E.M. 152.

E.M. 252 (2-0; 0-0)

Engineering Mechanics (Rigid Body Dynamics)—Kinetics of rigid body motion; energy and momentum methods for plane motion; eccentric impact; special problems in three dimensional motion; periodic motion.

Textbook: Beer and Johnston, *Vector Mechanics for Engineers* (McGraw-Hall).

E.M. 355 (0-0; 3-0)

Advanced Strength of Materials I—A review of the simple beam theory and its extension to unsymmetrical bending, curved beams, hooks and rings; deflections; shear flow and shear center; energy methods; statically indeterminate problems; temperature effects.

Textbook: Seely and Smith, *Advanced Mechanics of Materials* (Wiley).

E.M. 452 (0-0; 3-0)

Mechanical Vibrations—The behaviour of the lumped system of one and two degrees of freedom, together with discussion of vibration measuring instruments, vibration absorbers, vibration isolation, lumped systems of several degrees of freedom, vibration of beams, electrical equivalence of mechanical systems.

Textbook: Timoshenko, *Vibration Problems in Engineering* (Van Nostrand).

E.M. 453 (3-0; 0-0)

Mechanical Vibrations (For Electrical Engineers)—As E.M. 452.

Textbook: Thomson, *Vibration Theory and Applications* (Prentice-Hall).

E.M. 455 (3-0; 0-0)

Advanced Strength of Materials II—A continuation of E.M. 355 to include composite thin wall cylinders, thick cylinders, shrink fits; theories of failure and their application to design problems; torsion solid and open sections; stability; simple shells and membranes; temperature stresses.

Reference: Seely and Smith, *Advanced Mechanics of Materials* (Wiley).

E.M. 460 (0-0; 3-0)

Mechanics of Solids—Review of basic concepts in stress and strain, energy principles, temperature stresses, stress concentration, impact loading, fatigue, creep, yield criteria, contact stresses, hardness, viscous flow, lubrication.

Textbook: Long, *Mechanics of Solids and Fluids* (Prentice Hall).

F.M. 337 (3-2s; 0-0)

Fluid Mechanics—Vector calculus including the Divergence Theorem and Stokes' Theorem. Hydrostatics. Basic equations of classical hydrodynamics in vector form and curvilinear coordinates. Vorticity, circulaton, life, irrotational flow, stream function, potential function. Viscosity, laminar flow through tubes. Dimensional Analysis, Reynolds Number, Froude Number. Pipe flow. The seminar will be devoted to practical applications of above topics.

Textbook: Li and Lam, *Principles of Fluid Mechanics* (Addison Wesley)

Mech.E. 301 (1-3; 1-3)

Mechanical Measurments Laboratory—Characterization and behaviour of typical measuring systems, emphasizing wherever necessary the limitations of such measurements. Transducers, amplifiers, readout devices and their response to steady and transient phenomena are considered. Selected laboratories, experiments in heat transfer, fluid flow, thermodynamics, vibrations and strength of materials are used to illustrate the various measuring techniques.
Textbook: Beckwith and Buck, *Mechanical Measurements* (Addison Wesley).

Mech.E. 343 (0-0; 3-0)

Applied Thermodynamics and Heat Transfer (For Civil Students)—Review of fundamental concepts, air compressors, air engines, gas power cycles, vapor power cycles, refrigeration, psychrometric principles, Fourier's Law, Stefan-Boltzmann equation, steady state heat conduction, free and forced convection, radiation heat transfer.
Textbook: To be selected.

Mech.E. 346 (2-1; 2-1)

Transport Processes—Introduction to statistical thermodynamics: microscopic analysis of transport processes.
Transport of momentum: potential and viscous flow, turbulence. Transport of heat: conduction, convection and radiation. Irreversible thermodynamics: coupled flow of heat, mass and electricity. Principles of energy conversion; electro-thermal devices.
Textbook: To be selected.

Mech.E. 361 (2-3/2; 0-0)

Machine Components—Analysis and design of machine components; belts, brakes, clutches, gears, cams, springs, governors.
Textbook: Hannah and Stephens, *Advanced Mechanics of Machines* (Macmillan).

Mech.E. 362 (0-0; 2-3/2)

Mechanics of Machines—Kinetics of machines: velocity and acceleration diagrams, balancing, simple vibration problems, elementary lubrication theory, analysis and design of complete machine systems.
Textbook: Hannah and Stephens, *Advanced Mechanics of Machines* (Macmillan).

Mech.E. 401 (0-3; 0-3)

Mechanical Engineering Laboratory—Selected laboratory experiments covering material presented in applied thermodynamics, heat transfer, gas dynamics and engineering mechanics.

Mech.E. 405 (3-0; 0-0)

Power Plant Engineering—The economics, design and equipment of modern power stations and systems.
Reference: Morse, *Power Plant Engineering* (Van Nostrand)

Mech.E. 421 (3-0; 0-0) and (0-0; 3-0)

Applied Thermodynamics—Thermodynamic analysis of cycles and propulsion systems applicable to engines, steam and gas turbines, elementary rockets,

and refrigeration equipment. Principles of combustion. Heat balance problems.
Textbook: To be selected.

Mech.E. 436 (0-0; 3-0)

Applied Gas Dynamics—A study of two dimensional inviscid flow; Joukowski transformation; aerofoils. One dimensional compressible flow, subsonic and supersonic flow in ducts; shock waves. Two dimensional viscous compressible flow; laminar and turbulent boundary layers; separation. Analysis of blades and impellers.
Textbook: Kuethe and Schetzer, *Fundamentals of Aerodynamics* (Wiley).

Mech.E. 440 (3-0; 0-0)

Thermodynamics II—Extension of macroscopic techniques; Maxwell's relations between properties. Introduction to microscopic analysis; statistical thermodynamics with applications to solid and gaseous phases. Entropy and the third law of thermodynamics. Change of phase; first and second order changes; metastability.
Textbook: Lee, Sears and Turcotte, *Statistical Thermadynamics* (Addison Wesley).

Mech.E. 462 (2-3/2; 0-3)

Principles of Design—Application of the principles of mechanics and physical properties of materials to the design of machine elements. Selected projects requiring the student to exercise his creative ability, to make assumptions and decisions and in general, to devise new designs rather than analyze existing ones.
Textbook: Spotts, *Mechanical Design Analysis* (Prentice Hall).

Mech.E. 470 (3-0; 0-0)

Heat Transfer I—Fundamental steady state heat transfer principles: conduction, free and forced convection, radiation. Combined effects of conduction, convection and radiation. Dimensional analysis. Heat transfer in the unsteady state. Analogies. Numerical and graphical methods. Computer applications.
Textbook: Holman, *Heat Transfer* (McGraw-Hill).

Mech.E. 471 (0-0; 3-0)

Heat Transfer II—Selected topics in conductive, radiative, and convective heat transfer.
Textbook. To be selected.

Graduate Courses—

E.M. 551 (3-0; 0-0)

Theory of Elasticity—Fundamental concepts of elastic theory. Equation of stress equilibrium and strain compatibility. Solution of two dimensional problems. Analysis of stress and strain in three dimensions. Solution of torsion problems.
Textbook: Timoshenko and Goodier, *Theory of Elasticity.*
Selected references.

E.M. 552 (0-0; 3-0)

Dynamics of Structures—Behaviour of elastic structures subjected to dynamic loads. Vibrations of buildings and bridges excited by machinery,

earthquakes and wind, traffic.
Selected references.

E.M. 554 (0-0;3-0)

Theory of Elastic Stability—Stability analysis of bars under separate or combined axial, lateral, torsional loading, by solution of differential equations, energy approximations. Buckling of rectangular plates.
Textbook: Timoshenko and Gere, *Theory of Elastic Stability.*
Selected references.

E.M. 555 (3-0; 3-0)

Theory of Plasticity—Basic laws of stress and strain. Theories of strength. Plastic stress-strain relations. Problems in plastic flow of ideally plastic materials. Problems in plastic flow of strain-hardening materials. Applications to metal forming processes.
Textbook: Hill, *Mathematical Theory of Plasticity* (O.U.P.)

E.M. 556 (3-0; 0-0)

Theory of Plates—The plate equation in rectangular and polar coordinates. Solution of the plate equation for rectangular and circular plates under various loads. Special plate problems.
Textbook: Timoshenko and Woinowsky-Krieger, *The Theory of Plates and Shells* (McGraw-Hill).

E.M. 557 (0-0; 3-0)

Theory of Shells—Membrane theory of shells of revolution subjected to uniform and non-uniform loadings. Introduction to the bending theory of shells.
Textbook: Timoshenko and Woinowsky-Krieger, *The Theory of Plates and Shells* (McGraw-Hill).

E.M. 600-604 Max. of 6 hrs. credit in any project

Reading Projects in Engineering Mechanics—With permission of the department, projects may be selected from the following areas, E.M. 600 Elasticity; E.M. 601 Plasticity; E.M. 602 Plates; E.M. 603 Shells; E.M. 604 Vibrations.

Mech.E. 520 (2-3/2; 0-0)

Advanced Combustion Engineering—Detailed study of combustion in engines. Examination of theories of ignition, flame propagation and detonation. Special tests on gas turbine and variable compression C.F.R. Engine.
Selected references.

Mech.E. 521 (0-0; 2-3/2)

Advanced Combustion Engineering (Design)—Study of design problems in combustion engines. Effects of operating and design factors on performance. Design of gas turbines and internal combusition components.
Selected references.

Mech.E. 535 (3-0; 0-0)

Gas Dynamics I—Equations of motion in one dimension. Normal and oblique shock waves. Flow in ducts with heating and cooling. Generalized continuous flow. Wind tunnel operation and techniques.
Textbook: Owczarek, *Fundamentals of Gas Dynamics* (International).

Mech.E. 536 (0-0; 3-0)

Gas Dynamics II—Two and three dimensional compressible fluid flow. The small perturbation method. The hodograph method. Numerical calculation methods. The method of characteristics. Methods of measurement.
Selected references.

Mech.E. 540 (3-0; 0-0)

Thermodynamics III—Advanced macroscopic thermodynamic techniques. Kinetic theory, statistical mechanics, and information theory as applied to thermodynamics of the pure component and of mixtures. Thermodynamics of irreversible phenomena.
Textbook: Selected references.

Mech.E. 570 (3-0; 0-0)

Conduction Heat Transfer—General diffusion equation. Steady and transient one-dimensional and quasi-one-dimensional systems. Multi-dimensional systems. Special methods.
Textbook: Schneider, *Conduction Heat Transfer* (Addison Wesley).
Reference: H. S. Carslaw and J. C. Jaeger, *Conduction of Heat in Solids.*

Mech.E. 572 (0-0; 3-0)

Convection Heat Transfer—General theory of convection systems. Forced and free convection for laminar and turbulent conditions. Internal and external flows. Convection with change of phase.
Reference: Schlichting, *Boundary Layer Theory* (McGraw-Hill) (4th edition).

Mech.E. 573 (0-0; 3-0)

Turbulent Convection—Origin and mechanism of turbulence. Theory of turbulent convective systems. Turbulent convection near solid boundaries. Jets and wakes.
References: Schlichting, *Boundary Layer Theory* (McGraw-Hill) (4th edition); Hinze, *Turbulence* (McGraw-Hill).

Mech.E. 575 (0-0; 3-0)

Thermal Radiation—Principles of radiant energy transfer. Gaseous radiation. Spectral characteristics. Geometrical characteristics of systems involving thermal radiation. Electrical analogy.
Textbook: Selected references.

DEPARTMENT OF MINING AND METALLURGY

Met.E. 253 (3-0; 0-0)

Materials Science—Introductory course in Materials Science dealing with such topics as: atomic bonding and atomic co-ordination; molecular structures and crystal structures; noncrystalline solids; structural imperfections and atom movements; electronic processes and electrical, magnetic and thermal properties; metallic and ceramic phases and their properties; organic materials; multiphase materials; reactions in solid materials; modification of properties through changes in microstructure; stability of materials in service environments—corrosion, oxidation, thermal stability, radiation damage; composite materials.
Textbook: Van Vlack, *Elements of Materials Science,* (2nd Edition) (Addison Wesley).

Senior Courses—

M.E. 303 (2-3/2; 0-0)

Introduction to Mining—Elements of mining economics, field and geophysical prospecting, sampling and exploration of mineral deposits.

Exercises in the calculation of ore tonnages and grades, and applications of elementary statistics.

Textbooks: Peele, *Mining Engineers Handbook;* Young, *Elements of Mining;* Lewis, *Elements of Mining.*

M.E. 304 (0-0; 2-0)

Rock Mechanics and Explosives—Introduction to rock mechanics, strength properties of rock, stress distributions and failure theories, support; explosives and blasting.

References: Jaeger, *Elasticity, Fracture and Flow;* Isaacson, *Rock Pressure in Mines;* Coates, *Rock Mechanics Principles.*

M.E. 400 (3-0; 3-0)

Mining Methods—Mine development; alluvial mining, open-cut mining, stoping and coal-mining methods; mine power, hoisting, haulage; ventilation; mine organization and management; valuation.

References: Beringer, *Underground Practice in Mining;* Roberts, *Mine Ventilation;* Hoover, H., *Principles of Mining;* also Hoover, T. J., *Economics of Mining;* current periodicals and selected reading from other sources.

M.E. 401-403 (0-3; 0-6)

Mine Design—Drafting-room work on the exploration, surface, and underground layout of a mine. Working groups of students are formed and to each group is submitted a problem involving the planning and design of a coal or metal mine. Detailed drawings and written discussion, with necessary specifications and costs, are required from each group.

References: Staley, *Mine Plant Design;* Tillson, *Mine Plant;* Eaton, *Practical Mine Development and Equipment.*

M.E. 411 (0-3; 0-0)

Rock Mechanics Laboratory—Laboratory exercises in determining the physical properties of rock. Studies of simple mine structures under load, and of the behavior of granular or fragmented materials.

Met.E. 355 (3-3; 0-0)

Process Metallurgy I—Fundamentals and application of mineral dressing processes; including screening, partical size distribution of an ore grind, comminution theories, crushing and grinding, thickening, filtering, drying, jigging, folwing film concentration, amalgamation, static sink float, magnetic and electrostatic separation.

Textbooks: Gaudin, *Principles of Mineral Dressing* (McGraw-Hill); Beke, *Principle of Comminution* (Acad. of Sci., Budapest); Reference: Orr and Dallavalle, *Fine Particle Measurement* (MacMillan).

Met.E. 356 (0-0; 3-0)

Metallurgical Thermodynamics and Kinetics—Application of thermodynamics and kinetics to problems in extractive and solid state metallurgy: Review of

mathematical prerequisites, the degradation of energy, entropy and free energy of solid metals, liquid metals, metal-slag equilibria, reduction equilibria, principles of electrometallurgy, formal basis of diffusion theory, kinetics of metallurgical processes.

Textbook: Kubaschewski and Evans, *Metallurgical Thermochemistry* (Pergamon).
Reference: Darken and Gurry, *Physical Chemistry of Metals* (McGraw-Hill).

Met.E. 362 (0-0; 3-3)

Physical Metallurgy—The physical metallurgy of metals and alloys. Atomic and crystal structure of metals. Phases in metal systems. Diffusion in metals. Elasticity, anelasticity and plasticity. Recovery, recrystallization and grain growth. Heat-treatment and engineering properties of steels, cast irons, and selected non-ferrous alloys. Corrosion and oxidation. Metallurgy of welding and joining.

Textbook: Guy, *Physical Metallurgy for Engineers* (Addison-Wesley).
Reference: Samans, *Engineering Metals and Their Alloys* (MacMillan).

Met.E. 370 (0-0; 3-3)

Fundamentals of Physical Metallurgy I—Elements of crystallography. X-ray, electron and neutron diffraction. Thermodynamics of solids. Solidification. Phase equilibria. Crystal lattice defects. Diffusion and diffusion controlled transformations. Theory of alloys.

Textbook: R. E. Smallman, *Modern Physical Metallurgy* (2nd Ed.) (Butterworths).

Met.E. 404 and M.E. 404

Practical Experience—Before being granted his degree, a student must satisfy the Department that he has had at least six months' practical experience in mining, metallurgy, or geological field work. A suitable report on practical experience must be prepared and submitted to the Department *not later* than December 1 of the fourth year. Before starting to write the report, the student should consult the Department as to the suitability of the topic and the method of presentation.

Met.E. 433 (0-0; 0-3)

Mill Design—Flow sheet design, calculation of power and capacities for machines, quality control, instrumentation, sampling, testing, plan and elevation of mills, costs.

Met.E. 455 (3-3/2; 0-0)

Process Metallurgy II—Fundamentals and application of the hydrocyclone, flotation. Application of pyrometallurgical processes to the production of common, rare and refractory metals. Drying, calcining, sintering, roasting, smelting, distillation, direct reduction, thermal decomposition, liquation, zone refining, casting, metallurgical calculations and design.

Textbooks: Lilge, *Hydrocyclone Fundamentals* (IMM, London); Bradley, *The Hydrocyclone* (Pergamon); Gaudin, *Flotation* (2nd Edition) (McGraw-Hill).
References: AIME, *Froth Flotation* (50th Ann. Vol. 1962); Dennis, *Extractive Metallurgy* (Pitman).

Met.E. 456 (0-0; 3-3/2)

Process Metallurgy III—Fundamentals and application of hydrometallurgical and electrometallurgical processes: high and low temperature and pressure leaching, precipitation, evaporation, solvent extraction, ion exchange, adsorption, electro winning and refining, metallurgical calculations and design.

Textbook to be announced.

References: Kunin, *Ion Exchange Resins* (2nd Edition) (Wiley); Martin and Miles, *Chemical Processing of Nuclear Fuels* (Butterworth's); Mantel, *Industrial Electrochemistry* (McGraw-Hill).

Met.E. 461 (3-0; 3-3)

Applications of Physical Metallurgy—Properties of pure metals. Solidifaction, working and annealing. Strengthening mechanisms. Effects of environment, aqueous and liquid metal corrosion, oxidation, radiation. Two-phase alloys. Steels, commercially important alloys, cast irons, corrosion and heat resistant alloys. Sintered metal powders. Refractory materials. Composite materials. Metallurgy of welding and joining.

References: Brick and Phillips, *Structure and Properties of Alloys;* Uhlig, *Corrosion and Corrosion Control;* Dieter, *Mechanical Metallurgy;* Lancaster, *The Metallurgy of Welding, Brazing and Soldering.*

Met.E. 467 (0-0; 2-3)

Plant Operation and Design—Principles of plant design, production flow and movement, automation in the metallurgical industry, testing, inspection, quality control.

Met.E. 465 (0-3; 0-6)

Metallurgical Research Project—Research on current topics in metallurgical engineering, including physical, chemical and mechanical metallurgy, and mineral processing.

Met.E. 470 (3-3; 0-0)

Fundamentals of Physical Metallurgy II—Kinematics and dynamics of dislocations in crystals. Factors affecting the flow stress of metals. Interaction of dislocations with lattice defects and other perturbations. Precipitation hardening. Decomposition of austenite. Deformation twinning and martensite transformation. Elasticity and internal friction. Fracture, creep and fatigue. Prerequisite: Met.E. 370.

Textbook: R. E. Smallman, *Modern Physical Metallurgy* (2nd Ed.) (Butterworths).

Met.E. 490 (0-0; 0-1)

Colloquium—The colloquium, which meets once a week, is attended by fourth-year students and staff for discussion of topics from recent literature.

Graduate Courses—

Met.E. 500 (3-3; 0-0)

Metallurgical Thermodynamics—Applications of thermodynamics to pyrometallurgy, hydrometallurgy and corrosion. Effect of surfaces and interfaces.

Evaluation of thermodynamical data in metallurgical systems. Selected problems from metallurgical processes.

References: Swalin, *Thermodynamics of Solids;* Pourbaix, *Thermodynamics of Dilute Aqueous Solutions;* Elliott, *Physical Chemistry of Steelmaking.*

Met.E. 501 (3-3; 0-0)

Kinetics of Metallurgical Process—Lectures: Elementary wave and quantum mechanics. Quantum statistics; partition functions. Statistical treatment of reaction rates.

Processes: homogeneous gas and solution reactions; heterogeneous reactions—solid-gas, solid-liquid systems; viscosity and diffusion. Solid state transformations—nucleation, recrystallization, grain growth, precipitation reactions.

Laboratory: Problems: Determination of kinetic parameters: reaction order, activation energies. Calculation of partition functions. Interpretation of rate data for heterogeneous reactions—extractive and physical metallurgy proceses.

Reference: Glasstone, Laidler and Eyring, *Theory of Rate Processes.*

Met.E. 502 (0-3; 0-0)

Advanced Crystallography—Advanced work in determination of crystal structures: single crystal techniques, application of Fourier series; preferred orientation; electron diffraction. Advanced theory of imperfections.

Met.E. 503 (2-0; 2-0)

*Corrosion**—Electrochemical, overvoltage passivity, and reaction rate theories as applied to corrosion processes. Surface Chemistry of corrosion and inhibition. Galvanic and concentration cell reactions, atmospheric and soil corrosion, effect of mechanical factors in corrosion.

References: Evans, *Corrosion and Oxidation of Metals;* Pourbaix, *Thermodynamics of Dilute Aqueous Solutions.*

Met.E. 504 (0-6; 0-6)

Flotation—Problems in adsorption of flotation agents, kinetics of particle-bubble attachment and selective-flotation experiments.

Met.E. 505 (0-6; 0-6)

Hydrometallurgy—Physical chemistry of pressure leaching. Ionic processes in solution.

Met.E. 506 (2-3; 0-0)

Research Techniques in Metallurgy—Statistical analysis, electron microscopy and electron diffraction, crystal growth, diffuse scattering of x-rays, electron emission, high speed strain measurements, internal friction, radioactive tracers and radiation damage. Zone refining, high pressure and vacuum processes.

Met.E. 507 (3-0; 0-0)

Lattice Imperfections and the Mechanical Behavior of Solids—Elasticity of crystals; Point, line and plane defects; Anelasticity; Plastic yielding; Strain hardening; Alloy hardening; Fracture; Recovery and recrystallization; Creep; Fatigue; Radiation Damage.

References: Damask and Dienes, *Point Defects in Metals* (Gordon and Breach); Friedel, *Dislocations* (Addison-Wesley).

Note: The Department reserves the right to offer only those graduate courses for which a sufficient number of students register.

COURSES OFFERED BY OTHER DEPARTMENTS

CHEMISTRY

Chem. 232 (3-3; 3-3)

Modern Chemistry—Lectures: Atomic and molecular structure; states of matter and inter-molecular forces; solution chemistry and chemical equilibrium; inorganic chemistry of selected elements; introductory organic chemistry.
Laboratory: Experiments in general chemistry including some organic chemistry.
Prerequisite: Chemistry 130 or 30 of High School or equivalent.

Chem. 352 (3-2; 3-2)

Organic Chemistry—Lectures: An introduction to a study of the compounds of carbon.
Laboratory: The preparation of some organic compounds.
Prerequisite: Chemistry 230 or 232.

Chem. 432 (3-0; 3-0)

Inorganic Chemistry—Underlying principles of the subject followed by a study of the periodic table.
Prerequisite: Chemistry 230 or 232.
Prerequisite or corequisite: Chemistry 370 or 472.

Chem. 434 (3-3; 3-0)

Inorganic Chemistry—Underlying principles of the subject followed by a study of the periodic table.
Prerequisite or Corequisite: Chemistry 370 or 472.

Chem. 452 (3-0; 3-0)

Organic Chemistry—Continuation of the study of the aromatic and aliphatic compounds. General considerations and mechanisms involved in their reactions.
Prerequisite: Chemistry 350; 370 or 472.

Chem. 471 (0-0; 2-0)

Electrochemistry—Lectures: the theory of solutions; electrolysis; electrodes and electromotive force; galvanic cells; fuel cells, cell transport phenomena and electrochemical thermodynamics.
Prerequisite: Chemistry 232.

Chem. 472 (3-3; 3-3)

Physical Chemistry—States of matter, chemical bonding and structure, kinetics of reaction, surface and colloid chemistry; electrochemistry; radiation chemistry.
Prerequisite: Chemistry 232.

COMPUTING SCIENCE

Cmput 300 (2-1s; 0-0)or(0-0; 2-1s)

Compiler Language Programming—An introduction to digital computers. Internal organization; stored program concepts; approach to problems. Machine language coding. Compiler language coding stressing Fortran.

Cmput 458 (3-0; 0-0)or(0-0; 3-0)

Numerical Analysis and Computation Methods—Introduction to linear algebra. Methods of solution for linear algebraic equations. Use of variational principles. Numerical methods for solving equilibrium problems and propagation (or rate) problems.

Prerequisite: Mathematics 405 or 406 or 407 or equivalent, and Computing Science 300 or equivalent.

ECONOMICS

Econ. 303 (2-0; 2-0)

Principles of Economics—An introduction to economic principles as applied to business organization and finance; price determination; enterprise costs and output optimization; commercial and central banking; national income analysis; public finance, monetary and fiscal policy in relation to the business cycle and economic growth.

Econ. 304 (3-0; 0-0)or(0-0; 3-0)

Principles of Economics—An introduction to economic principles as applied to business organization and finance; price determination; enterprise costs and output optimization; commercial and central banking; national income analysis.

NOTE: Economics 303 may be accepted as a prerequisitie for senior courses in economics only if prior departmental approval is obtained.

ENGLISH

English 250 (2-0; 2-0)

The reading of representative works of English literature, with some practice in writing.

GEOLOGY

Geol. 230—A. J. Broscoe (0-0; 3-3)

Introductory Geology—A study of the fundamental aspects of physical geology, rock-forming minerals, common rocks, structural geology, ground water, orogenesis, vulcanism, seismology, and the geologic time scale. The laboratory consists of hand specimens of minerals and rocks and the interpretation of geologic structures from topographic and geologic maps.

Textbook: Dapples, *Basic Geology for Science and Engineering.*

Senior Courses—

Geol. 330—A. J. Broscoe (3-3; 0-0)

A study of geological processes of particular importance to the Civil Engineer: rock weathering, landslides, rivers, waves, wind, and glaciation. The laboratory consists of study of air photographs and maps illustrating the results of these processes and demonstrating means of mapping of surficial deposits.

Textbook: Dapples, *Basic Geology for Science and Engineering.*

Prerequisite: Geology 230.

Geol. 402—H. A. K. Charlesworth (3-3; 0-0)

Principles of Structural Geology—Theoretical structural geology; non-orogenic structures; faults; folds; elementary petro-fabric analysis; problems on folding and faulting.

Prerequisite: Geology 303 and Physics 240, or consent of department.

Geol. 406—H. A. K. Charlesworth (0-0; 3-3)

Geotectonics—Origin and gross tectonic framework of ocean basins, continental margins and continents; causes of orogenesis; structural geology of North America; problems on folding and faulting; interpretation of geologic maps.

Prerequisite: Geology 402.

Geol. 414 (3-3; 0-0)

Mineralogy—Principles of geometrical crystallography; physical and chemical properties of minerals. Determinative mineralogy.

Prerequisite: Geology 230.

Geol. 421

Intermediate Mineralogy—Chemical crystallography, theory of x-ray diffraction and phase equilibria.

Prerequisite: Geology 414 or consent of department.

Corequisite: Chemistry 370 or consent of department.

Geol. 450—R. A. Burwash (0-3; 0-0)

Petrology—Study of igneous, sedimentary and metamorphic rocks in hand specimen.

Prerequisite: Geology 230 and 414.

Geol. 454 (3-3; 3-3)

Petrology—Introduction to petrography; optical properties of common rock-forming minerals; classification and genesis of igneous and metamorphic rocks; examination of rock sections.

Prerequisite: Geology 414.

Geol. 460—R. E. Folinsbee (0-0; 3-3)

Metallic Mineral Deposits—Classification, mode of occurrence, and geological relations of various types of mineral deposits.

Textbook: Park and MacDiarmid, *Ore Deposits.*

Prerequisite: Geol. 230 and consent of department.

Geol. 461—J. F. Lerbekmo (0-0; 3-3)

Geology of Petroleum, Natural Gas and Coal—Classification, mode of occurrence and geological characteristics of petroleum, natural gas and coal deposits.

Textbook: Levorsen, *Geology of Petroleum.*

Prerequisite: Geology 230 and consent of department.

Geol. 462—A. J. Broscoe (1-3; 0-0)

Photogeology—The application of aerial photographs to the preparation of planimetric and geological maps. Mapping of stratigraphy and structure on aerial photographs.

Textbook: Miller, *Photogeology.*

Prerequisite: Geology 230 or consent of department.

Geol. 465—A. J. Broscoe (3-3; 0-0)

Geomorphology—A study of land forms and the processes which create and modify them: weathering, mass-wasting, stream erosion, wave erosion, wind erosion, glaciation; study of land forms on aerial photographs and topographic maps; field trips.
Textbook: Thornbury, *Principles of Geomorphology.*
Prerequisite: Geology 230 or consent of department.

Geol. 466—J. A. Westgate (0-0; 3-3)

Glacial Geology—Elements of glaciology; description of glacial deposits and land forms; glacial stratigraphy of North America and Europe; interpretation of glacial features from topographic maps and aerial photographs; examination of glacial sediments; field trips.
Textbook: Flint, *Glacial and Pleistocene Geology.*
Prerequisite: Geology 230 or consent of department.

MATHEMATICS

Junior and Senior Courses—

Math. 212 (4-2; 0-0)or(0-0; 4-2)

Introductory Calculus—Basic notions of derivative and integral. Differentiation and integration of functions of one real variable. Applications.
Prerequisite: Mathematics 30 and 31.

Math. 213 (0-0; 4-2)

Calculus—Partial differentiation. Multiple integration. Calculus of vector functions of one variable. Complex numbers. Infinite series.
Prerequisite: Mathematics 30 and 31 and Mathematics 212 or equivalent.

Math. 306 (5-0; 5-0)

Advanced Calculus—Sequences and series, differential calculus of scalar fields, linear differential equations, multiple integrals. Line integrals. Theorems of Gauss, Green, and Stokes.
Prerequisite: Mathematics 206 or consent of department.
Prerequisite or co-requisite: Mathematics 271.

Note:

This course is required for second year honors students in Mathematics and Physics. Other students admitted only with the consent of the department.

Math. 312 (3-2s; 0-0)

Linear Algebra—Algebra and geometry of vector spaces, linear transfrmations and matrices. Linear equations (including computational methods). Quadratic forms and symmetric matrices. Elementary eigenvalue theory.
Prerequisite: Mathematics 212 and 213.

Math. 313 (0-0; 3-2s)

Differential Equations—Infinite series, including Taylor series expansions. Hyperbolic functions. Linear differential equations with constant coefficients and first-order systems. First order linear and non-linear equations. Picard's method. Numerical techniques.
Prerequisite: Mathematics 212 and 213.

Math. 404 (3-0; 3-0)

Advanced Calculus—Vector analysis. Ordinary differential equations. Series solutions of differential equations. Gamma, Bessel and Legendre functions. Fourier series. Boundary value problems.

Prerequisite: Mathematics 304 or its equivalent.

Math. 405 (4-0; 4-0)

Advanced Calculus—Matrices. Ordinary differential equations. Series solutions of differential equations. Zeros of polynomials. Fourier series and Fourier integral. Laplace transforms. Introduction to theory of complex variables. Vector analysis. (For Electrical Engineers.)

Prerequisite: Mathematics 303 or Mathematics 312 and 313 or equivalents.

Math. 406 (3-0; 3-0)

Advanced Calculus—Ordinary differential equations. Series solutions of differential equations. Partial differentiation and partial differential equations. Gamma and Bessel functions. Fourier series. Numerical methods. Boundary value problems. (For Chemical and Petroleum Engineers).

Prerequisite: Mathematics 303 or Mathematics 312 and 313 or equivalents.

Math. 407 (3-0; 3-0)

Advanced Calculus—Ordinary differential equations. Series solutions of differential equations. Fourier series. Partial differentiation and partial differential equations. Vectors. Boundary value problems. (For Mechanical and Metallurgical Engineers).

Prereqiusite: Mathematics 303 or Mathematics 312 and 313 or equivalents.

Math. 408 (3-0; 0-0)or(0-0; 3-0)

Theory of Functions of a Complex Variable—Complex numbers. Complex series. Functions of a complex variable. Cauchy's theorem and contour integration. Conformal mappings. Schwartz-Christoffel transformation. Inverse Laplace transforms.

Prerequisite or corequisite: Mathematics 405 or 406 or 407.

Math. 430 (3-0; 3-0)

Advanced Mechanics—Review of Newton's Laws. Lagrange's equations derived from Newton's Laws and D'Alembert's principle. The central force problem. Motion of a rigid body. Tops and gyroscopes. Variational principles. Hamilton's equations. Canonical transformations. Hamilton-Jacobi equation.

Prerequisite: Mathematics 309 or Physics 370 or consent of the department.

Math. 480 (3-0; 0-0)

Cartesian Tensors and Applications—Euclidean vector spaces. Linear transformations and matrices. Algebra of cartesian tensors. Vector and tensor calculus. Determinants. Structure of second-order tensors. Isotropic tensors. Physical applications.

Prerequisite or corequisite: Mathematics 404 or 405 or 406 or 407.

Math. 500 (3-0; 3-0)

Theory of Functions of a Complex Variable—Complex numbers. Complex series. Functions of a complex variable. Cauchy's theorem and the calculus of

residues. Integral functions. Conformal representation. The Laplace and Fourier transforms.
Prerequisite: Mathematics 404 or 405 or 406 or 407.
(For students in the fourth year of Special Engineering programs.)

Math. 555 (3-0; 3-0)
Hydro- and Aero-dynamics—Classical hydrodynamics. Kutta-Joukowski theory of airfoils. Boundary layers. Flow of a viscous fluid. Supersonic flow. Shock waves.

PHYSICAL EDUCATION

All first-year students are required to register in Physical Education 218—*Men or Physical Education* 228—*Women.*

Phys.Ed. 218—Physical Education Staff (0-2; 0-2)
Recreational Activities (Men)—Emphasis on the fundamentals of the following recreational and fitness activities: circuit training, aquatics, handball, badminton, volleyball, tumbling and apparatus.

Phys.Ed. 228—Physical Education Staff (0-2; 0-2)
Recreational Activities (Women)—Emphasis on the fundamentals of the following recreational and fitness activities: aquatics, movement fundamentals, tennis, badminton, dance and golf.

PHYSICS

Phys. 230 (3-2/2s-3/2; 3-2/2s-3/2)
Dynamics, Waves and Optics—Geometrical and Physical Optics: Doppler effect, reflection, refraction, plane and spherical mirrors, thin lenses, interference, diffraction polarization, light scattering. Waves: mechanical waves, oscillations, sound, harmonic motion, resonance. Dynamics: Kinematics, conservation laws, work, energy, momentum, gravitation.

Phys. 330 (4-2/2s-3; 0-0)
Electricity and Magnetism—Electrostatistics, the electric field, potential, capacitance, magnetic fields, electromagnetism, induced EMF, magnetic properties of matter, electromagnetic oscillations.
Prerequisites: Physics 230, Mathematics 212.

Phys. 416 (2-0; 2-0)
Introduction to Wave Mechanics and Theory of Solids—The Schrodinger equation, quantum statistics, binding forces, elestron theory of solids, properties of metals and semi-conductors.
Prerequisites: Physics 330, Mathematics 303.

Phys. 474 (1-0; 3-0)
Relativity and Introduction to Wave Mechanics—Special relativity, wave mechanics; introduction to Schrodinger equation; solutions for plane waves, hydrogen-like atom, vector model of the atom.
Prerequisite: Physics 330.
Prerequisite or corequisite: Mathematics 404.

Phys. 468 (0-3; 0-3)

Advanced Laboratory—Methods in experimental atomic physics, spectroscopy and nuclear physics; introduction to modern laboratory techniques.
Corequisite: Physics 474.

Phys. 480 (3-3; 3-3)

Electromagnetism—Potential theory; description of electromagnetic field using vector methods; Maxwell's equations; electromagnetic waves in continuous media and in guides; selected topics in electromagnetism.
Prerequisite: Physics 340 or 380.
Prerequisite or corequisite: Mathematics 421.

Phys. 482 (3-0; 3-0)

Electromagnetism—Same as Phys. 480 for students in Engineering Physics.

Phys. 510 (3-0; 3-0)

Thermodynamics and Kinetic Theory—The statistical basis of thermodynamics is developed. Topics include irreversible processes, Boltzmann, Fermi-Dirac, and Bose-Einstein statistics, phase equilibria, transport phenomena, chemical reactions and fluctuations.
Prerequisites: Physics 350, Mathematics 421, or 404.

Phys. 516 (2-0; 2-0)

Introductory Solid State Physics—An introduction to the theory of solids, including a study of the properties of metals, semiconductors and dielectrics.
Corequisite: Physics 570.

Phys. 520 (3-3; 3-3)

Geophysics—Physical structure of the earth. Earthquake and explosion seismology, gravity, heat flow and age determination, tectonophysics. Geomagnetic, paleomagnetic and electromagnetic methods in the study of the earth. Methods of geophysical exploration.
Prerequisites: Mathematics 404.
Prerequisite or corequisite: Physics 482.

Phys. 530 (2-0; 2-0)

Physics of Atoms, Nuclei, and Crystals—Relativity physics, quantum theory and wave mechanics, atomic structure and spectra, high-energy radiations, nuclear structure, nuclear reactions and energy sources, quantum statistics, crystalline properties of the solid state.
Prerequisites: Physics 430, Mathematics 404, or equivalents.

Phys. 550 (3-0; 3-0)

Mathematical Physics—This course is intended as an introduction to the principal mathematical methods of dealing with the scalar and vector fields of physics. Topics include the Sturm-Liouville theory of eigenvalue problems, matrices, partial differential equations, operational methods and Laplace transforms, Fourier transforms, Green's functions, integral equations and the nonlinear equations of hydrodynamics. One hour per week will be spent on class discussion of problems.
Prerequisite: Mathematics 421.
Prerequisite or corequisite: Phys. 480.

Phys. 570 (3-0; 3-0)

Relativity and Quantum Mechanics—Special theory of relativity. Introduction to quantum mechanics with applications to atomic and modern physics.
Prerequisite: Physics 474, Mathematics 421 and 430, or equivalents.
Prerequisite or corequisite: Phys. 480.

Phys. 572 (2-0; 2-0)

Nuclear Physics—Introductory survey of modern experimental and theoretical nuclear physics.
Corequisite: Physics 570.

Phys. 576 (0-0; 3-0)

Reactor Physics—Slowing of neutrons, neutron diffusion theory, the pile equations, critical dimensions for simple pile shapes, the neutron cycle, reactor cycle, reactor control, health physics.
Corequisite: Physics 572.

STATISTICS

Stat. 450 (3-0; 3-0)

Probability and Statistics—Theory of probability. Distribution functions and characteristic functions. Central limit theorem. Sampling. Exact sampling distributions. Confidence intervals. Maximum likelihood. Statistical inference. Methods of least squares. Analysis of variance.
Prerequisite: Mathematics 312 and 313 or 306.
(Some previous knowledge of elementary statistics is advisable.)

XIV

The School of Household Economics

INFORMATION, REGULATIONS, COURSES

(1) INTRODUCTION

Degree programs in Household Economics have been offered at the University of Alberta since 1918, when a department of Household Economics was established. In 1928 the School of Household Economics was organized under the Faculty of Arts and Science. In 1963, it was placed under the newly organized Faculty of Science.

The programs of study offered are designed to provide the student with a foundation in arts and science and household economics. The programs are three-year ones (the first year may be taken at the University of Calgary or at one of the following junior colleges: Red Deer, Camrose, Lethbridge, Medicine Hat). Additional study or training must be completed if the graduate wishes to teach or become a dietitian.

A student may enroll in one of the following programs of study: *foods and nutrition, clothing and textiles,* or *the general program.*

1. The *foods and nutrition program* is suitable for students planning to become dietitians, nutritionists or home economists in the food industry. Post graduate study in foods and nutrition may be pursued at this or another university, and financial aid is usually available; excellent opportunities are open to the holder of a Master's or Ph.D. degree.

To qualify as a professional dietitian, the graduate must spend twelve months in an interneship program approved by the Canadian Dietetic Association. It is now possible for a student to complete part of this twelve month interneship during the summers between university sessions, thus integrating interneship with university study; the student is paid during the time she is serving interneship each summer.

2. The *clothing and textiles program* is suitable for students who are especially interested in clothing construction, design and textiles, and who wish to concentrate their studies in this area to the exclusion of other facets of home economics. The study of textiles and clothing and applied art may be continued in post graduate programs in other universities.

3. The *general program* is suitable for students planning to become teachers or home economists with the Department of Agriculture and with utility companies. Those wishing to teach must complete further study in the Faculty of Education—one year to qualify for a teaching certificate or two years to qualify for the Bachelor of Education degree. (See Faculty of Education calendar).

It should be noted that if graduates of either the *food and nutrition* or the *clothing and textiles* program wish to teach they, too must complete further study in the Faculty of Education, but they must also take those household economics courses from the general program which they lack; to do both will take two years.

Graduates who have completed any one of these programs and who have particular aptitudes for work in radio, television and journalism, may find opportunities in these fields. It is possible for graduates who are interested in social work to pursue this interest by enrolling in a degree program in some schools of Social Work; it should be realized, however, that only certain personality types will succeed in social work.

Students are invited to consult the Director of the School with respect to the choice of courses.

(2) ADMISSION

For the degree of B.Sc. in H.Ec.:

(a) a High School diploma with

(b) 50% or higher standing in Departmental examinations in

1. English 30,
2. Social Studies 30,
3. Mathematics 30,
4. French 30 or German 30 or Latin 30 or Ukrainian 30, or another language at an equivalent level,
5. Chemistry 30, and
6. Physics 30 (preferred) or Biology 30 (Biology 32 will be accepted if taken before September 1965).

(c) an average in these six courses of at least 60%.

NOTE: Although home economics courses are not required for admission, students will probably gain additional benefits from the university programs if they have studied home economics in high school.

These general regulations notwithstanding, the University may in its discretion, refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements at the University of Alberta.

(3) PROMOTION

To be granted the degree of B.Sc. in Household Economics students must present passing grades (4 or better) in a minimum of fourteen full courses, not less than 3 in a fifteenth course, and a Grade Point Average of at least 5.0 (formerly an average of 60%) in all courses credited towards the degree after the first year. Students transferring to this University with advanced standing will be required to complete at least five of the fifteen courses at the University of Alberta.

The normal program is set out below, i.e. five full courses per year in each of the first two years and five and one-half courses in the third year. The Director may, in exceptional circumstances, permit a student to proceed to a degree over a longer period, or to meet requirements in a shorter period by attendance at summer session and by taking extra courses during the regular session.

A student will not be allowed to write more than five supplemental examinations for the purpose of obtaining passing marks or raising her Grade Point Average to the required 5.0. A student will not be allowed to write more than two supplemental examinations in any year.

A student who is repeating a year will be granted no supplemental privileges in the courses taken that year and must pass all courses with a Grade Point Average of 5.0 to be allowed to continue. The privilege of repeating a year will be granted to a student not more than once during her candidacy for a degree in this School, unless by special permission of the Director.

Students who interrupt their degree program are warned that after an absence of two calendar years from academic study at university level they may be required to comply with any new regulations which have come into effect in regard to their program and requirements. If the absence has been of more than five years' duration, the student may be required to take placement tests.

(4) PROGRAMS OF STUDY FOR THE B.Sc. DEGREE IN HOUSEHOLD ECONOMICS

(a) Students entering first or second year in the 1966-67 session will complete one of the following programs:

Foods and Nutrition Program

First Year

English 210
Chemistry 230
Chemistry 250
Biology 130 or 230
Microbiology 201 (half course)
H.Ec. 221—Basic Foods I (half course)
Physical Education

Second Year

Arts option
Biochemistry 300
Physiology 361
H.Ec. 321—Basic Foods II (half course)
H.Ec. 323—Food Purchasing and Preservation (half course)
Either: H.Ec. 303—Home Management (half course)
and H.Ec. 355—Family Finance (half course)
Or: Business 300

Third Year

Senior Arts option
Approved option
H.Ec. 458—Nutrition
Five half-year courses chosen from the following:
H.Ec. 425—Diet and Disease
H.Ec. 427—Experimental Foods
H.Ec. 429—Advanced Experimental Foods
H.Ec. 455—Family Living
H.Ec. 459—Methods of Presentation
H.Ec. 461—Institution Management I
H.Ec. 463—Institution Management II
H.Ec. 201—Clothing Design and Selection
H.Ec. 309—Textiles

Clothing and Textiles Program

First Year

English 200
Chemistry 250
Art 200
Approved Arts or Science option
H.Ec. 201—Clothing Design and Selection (half course)
H.Ec. 203—Clothing Construction and the Basic Pattern (half course)
Physical Education

Second Year

History 200
Approved Arts or Science option
Art 230
H.Ec. 350—Applied Art
Two half-year courses in Clothing and Textiles*

Third Year

Approved Arts option
Approved Arts option
Approved option
H.Ec. 459—Methods of Presentation (half course)
Or H.Ec. 355—Family Finance (half course)
Four half-year courses in Clothing and Textiles*

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*Courses should be taken in the following order:
H.Ec. 307—Clothing Construction
H.Ec. 309—Textiles
H.Ec. 311—Consumer Textiles
H.Ec. 401—Costume Design
H.Ec. 403—History of Costume and Textiles
Others:
H.Ec. 405—Original Apparel Design
H.Ec. 407—Tailoring
H.Ec. 411—Advanced Textiles
Students granted advanced placement may substitute H.Ec. 205 for H.Ec. 203 and H.Ec. 307.

General Program

First Year

English 200 or 210
Chemistry 250
Arts or Science option[1]
Arts or Science option[1]
H.Ec. 201—Clothing Design and Selection (half course)
H.Ec. 221—Basic Foods I (half course)
Physical Education

Second Year

Economics 200
Arts or Science option[1]

Arts or Science option[1]
H.Ec. 203[2]—Clothing Construction and the Basic Pattern (half course)
H.Ec. 303—Home Management (half course)
H.Ec. 307[2]—Clothing Construction (half course)
H.Ec. 321—Basic Foods II (half course)

Third Year

Option[3]
Senior option[1]
H.Ec. 350—Applied Art
H.Ec. 355—Family Finance (half course)
H.Ec. 424—Nutrition
H.Ec. 455—Family Living (half course)
H. Ec. 459—Methods of Presentation (half course)

[1]Students must select a minimum of three courses in a subject of concentration.

[2]Students granted advanced placement may substitute H.Ec. 205 and 309 for H.Ec. 203 and 307.

[3]If H.Ec. 309 has not been taken, it must be chosen.

Note: Students who plan to qualify as teachers after obtaining the B.Sc. (H.Ec.) degree are reminded that Psychology 202 and Philosophy 240 are prerequisites for courses in the first year of the B.Ed. program.

(b) **Students who completed the first year in Calgary or at at junior college and who are entering second year in the 1966-67 session will complete one of the following programs:**

Foods and Nutrition Program

Second Year

Biochemistry 300
Physiology 361
Microbiology 201 (half course)
H.Ec. 221—Basic Foods I (half course)
H.Ec. 321—Basic Foods II (half course)
H.Ec. 323—Food Purchasing and Preservation (half course)
Either: H.Ec. 303—Home Management (half course)
and H.Ec. 355—Family Finance (half course)
Or: Business 300

Third Year

Arts option*
Senior Arts option
H.Ec. 458—Nutrition

*This applies to students who took Mathematics 211 in the first year as an approved option; if, however, an Arts option was taken in the first year, an approved option may be substituted.

Five half-year courses chosen from the following:
H.Ec. 425—Diet and Disease
H.Ec. 427—Experimental Foods
H.Ec. 429—Advanced Experimental Foods
H.Ec. 455—Family Living
H.Ec. 459—Methods of Presentation
H.Ec. 461—Institution Management I
H.Ec. 463—Institution Management II
H.Ec. 201—Clothing Design and Selection
H.Ec. 309—Textiles

Clothing and Textiles Program

Second Year

History 200
Art 230—Fundamentals of Design
H.Ec. 350—Applied Art
H.Ec. 201—Clothing Design and Selection (half course)
H.Ec. 203—Clothing Construction (half course)
2 half-year courses in Clothing and Textiles*

Third Year

Approved Arts option
Approved Arts option
Approved option
H.Ec. 459—Methods of Presentation (half course)
or H.Ec. 355—Family Finance (half course)
4 half-year courses in Clothing and Textiles*

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*Courses should be taken in the following order:
H.Ec. 307—Clothing Construction
H.Ec. 309—Textiles
H.Ec. 311—Consumer Textiles
H.Ec. 401—Costume Design
H.Ec. 403—History of Costume and Textiles
Others:
H.Ec. 405—Original Apparel Design
H.Ec. 407—Tailoring
H.Ec. 411—Advanced Textiles
Students granted advanced placement may subsitiute H.Ec. 205 for H.Ec. 203 and H.Ec. 307.

General Program

Second Year

Arts or Science option[1]
Arts or Science option[1]
H.Ec. 201—Clothing Design and Selection (half course)
H.Ec. 203[2]—Clothing Construction and the basic pattern (half course)
H.Ec. 221—Basic Foods I (half course)
H.Ec. 303—Home Management (half course)
H.Ec. 321—Basic Foods II (half course)
H.Ec. 355—Family Finance (half course)

Third Year

Option[3]
Senior option[1]
H.Ec. 307[2]—Clothing Construction (half course)
H.Ec. 350—Applied Art
H.Ec. 424—Nutrition
H.Ec. 455—Family Living (half course)
H.Ec. 459—Methods of Presentation (half course)

[1]Students must select a minimum of three courses in a subject of concentration.
[2]Students granted advanced placement may subsititue H.Ec. 205 and 309 for H.Ec. 203 and 307.
[3]If H.Ec. 309 has not been taken, it must be chosen.

Note: Students who plan to qualify as teachers after obtaining the B.Sc. (H.Ec.) degree are reminded that Psychology 202 and Philosophy 240 are prerequisites for courses in the first year of the B.Ed. program.

(5) B.Sc. IN HOUSEHOLD ECONOMICS AFTER B.Ed.

Students who have qualified for the degree of Bachelor of Education may proceed to the degree of Bachelor of Science in Household Economics if they have completed at least thirteen courses in Arts and Science and Household Economics. They will be required to complete the B.Sc. program with a minimum of six senior courses. Such students will be required to obtain a Grade Point Average of 5.0 (formerly 60%) in these courses.

(6) GRADUATE STUDIES

Graduate work leading to the degree of Master of Science may be undertaken in the Department of Household Economics. The major work may be done in the field of nutrition where excellent facilities are available for a limited number of students interested in fundamental research. Students wishing to pursue graduate work should consult the Director of the School of Household Economics and familiarize themselves with procedures and regulations laid down by the Faculty of Graduate Studies.

(7) DETAILS OF COURSES

The University reserves the right to modify or withdraw for the session any of the courses here outlined.

Students are reminded of the regulations regarding attendance requirements and debarment from final examinations.

NOTE: In the case of courses in which the weekly hours of instruction are fixed, these are set out for both terms of the winter session. The first figure in each term indicates lecture-hours and the second laboratory-hours.

ART

Art 200 (3-0; 3-0)

Introduction to the History of Art—Beginning with a discussion of fundamental concepts underlying painting and the plastic arts, this course investigates the major styles and contributions of each important period.

Art 230 (1-4; 1-4)

Fundamentals of Design—The study and practical application of principles of composition and picture making, methods of construction in design and the use of conventional and abstract forms.

BIOCHEMISTRY

Bioch 300—Members of Staff (3-3; 3-3)

General Course—Structure and chemistry of the cell; acidimetry and alkalimetry; chemistry of carbohydrates, lipids, proteins and nucleic acids; enzymes; bioenergetics; digestion, absorption and intermediary metabolism of carbohydrates, lipids, proteins, and nucleic acids; mineral metabolism; vitamins; blood chemistry; chemistry of respiration.

Prerequisites: Chemistry 230 and Chemistry 250.

BIOLOGY

Biol 130 (3-3; 3-3)

An introduction to Biology, with emphasis on principles. Not open to students with credit in Biology 30.

Biol 230 (3-3; 3-3)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This course is prerequisite to most senior biology courses.

Prerequisite: Biology 30 or Biology 130.

BUSINESS

Bus 300 (3-0; 3-0)

Administrative Principles—Functions of management—planning, organization, staffing, directing and controlling.

CHEMISTRY

Chem 130 (3-3; 3-3)

Introductory General Chemistry—Lectures: An introduction to chemical principles illustrated by the chemistry of metals, non-metals and carbon compounds.

Laboratory: Experiments related to the lecture material.

Chem 230 (3-1S-3) (3-1S-3)

Inorganic Chemistry—Lectures: The fundamental concepts of chemistry as applied to the elements and their compounds.

Laboratory: The preparation of compounds, quantitative chemistry.

Prerequisite: Chemistry 130 or Chem. 30 of High School or equivalent.

Chem 250 (3-1S*-3)(3-1S*-3)

Organic Chemistry—Lectures: An introduction to a study of the compounds of carbon.

Laboratory: The preparation of some organic compounds.

Textbook: Boyd and Morrison, *Organic Chemistry.*

Prerequisite: Chemistry 130 or Chem. 30 of High School or equivalent.

*Students not concurrently taking Chemistry 230 are required to take the one hour seminar.

ECONOMICS

Econ 200 (3-0; 3-0)

Principles of Economics—A survey of various aspects of economics; the nature of economic problems and systems; the functions of money; commercial and central banking; national income analysis; monetary and fiscal policy; pricing under competitive and monopolistic conditions; selected topics in analysis and policy.

ENGLISH

Engl 200 (3-0; 3-0)

A Survey of English Literature from Chaucer to the Twentieth Century—A close study of representative masterpieces. Essays and tests on the prescribed literature will be given to afford practice in setting down ideas in good English.

Engl 210 (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

HISTORY

Hist 200 (3-1s; 3-1s)

European History—The history of Europe from the decline of the Roman Empire in the West to the present.

HOUSEHOLD ECONOMICS

STAFF:—

Professor and Director of the School—Elizabeth L. Empey

Associate Professors—Helen Bentley, Grace L. Duggan, Helen Moseson, Ruth Renner

Assistant Professors—Thelma Dennis, Nancy Kerr, Verna Lefebvre, Annette Ostapovitch, Judith Strang

Lecturers—Grace E. Cairns (Dietitian, University Cafeteria), Roberta Cheney, Margaret Shaw (Dietitian, Lister Hall), Gail Stinson

Sessional Instructors—Elaine Barnes, Margaret Gee, Neva O'Bryan, Marion Zarkadas

HEc 201 (3-3; 0-0)or(0-0; 3-3)

Clothing Design and Selection—Practical application of principles of design in clothing selection. Becoming and appropriate clothing for the individual. Consideration of age, social and economic factors.

HEc 203 (3-3; 0-0)or(0-0; 3-3)

Clothing Construction and the Basic Pattern—A basic commercial pattern fitted in muslin and developed into a master pattern. Basic garment construction. Construction of a selected dress design in appropriate fabric.

Prerequisite: HEc 201.

HEc 205 (3-3; 0-0)or(0-0; 3-3)

Clothing Construction and the Basic Pattern—A basic commercial pattern fitted in muslin and developed into a master pattern. Construction techniques applied to specific problems.

Prerequisite: HEc 201.

HEc 221 (3-3; 0-0)or(0-0; 3-3)

Basic Foods I—Scientific principles involved in preparing and handling selected foods: fruits, vegetables, cereals, flours, leaveners, sugars, batters and doughs.

Prerequisite: Chemistry 250.

HEc 303 (3-3; 0-0)

Household Management—Application of home management principles in use of time, energy and equipment. Selection, arrangement and care of materials and equipment used in the kitchen and laundry.

HEc 307 (3-3; 0-0)or(0-0; 3-3)

Clothing Construction—Construction techniques applied to specific problems. Evaluation of methods used in present-day clothing construction. Consideration of individual resources, need, skills and management.

Prerequisite: HEc 203.

HEc 309 (3-3; 0-0)or(0-0; 3-3)

Textiles—Fiber production, yarn development, fabric construction and finishes as applied to end uses in apparel and household fabrics.

HEc 311 (0-0; 3-0)

Consumer Textiles—Interpretation of basic textile information and other factors related to consumer selection, use and care of apparel and household textiles.

Prerequisite: HEc 309.

HEc 321 (3-3; 0-0)or(0-0; 3-3)

Basic Foods II—Scientific principles involved in preparing and handling selected foods: meats, fish, poultry, eggs, milk, cheese, fats and oils.

Prerequisite: Chemistry 250.

HEc 323 (0-0; 3-3)

Food Purchasing and Preservation—Recent methods of preserving foods. Preparation and service of meals.

Prerequisite: HEc 221 and HEc 321.

HEc 325† (0-0; 3-3)

Nutrition—A study of the nutrients essential to human life and well being, their function in metabolism and their sources of food. Laboratory exercises in preparing and serving meals.

Prerequisites: H.Ec. 221 and H.Ec. 321 and Chemistry 250.

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†For Education students only.

HEc 350 (3-3; 3-3)

Applied Art—The principles and elements of design; selection and arrangement of materials and objects in the home; analysis of house plans. Historic styles of architecture and furniture and their relation to contemporary design.

HEc 355 (0-0; 3-0)

Family Finance—Standards of living; family income, savings and expenditures; consumer economics and consumer education.

HEc 401 (0-0; 1-5)

Costume Design—Principles of designing clothes by flat pattern techniques. Development of designs for specific garments. Development of original designs and construction of the garments in appropriate fabrics.

Prerequisite: HEc 205 or 307 and HEc 309.

HEc 403 (3-0; 0-0)

History of Costume and Textiles—Fabrics and costumes from ancient times to the present day; their relationship to life of the times and their importance in evolution and inspiration of modern dress.

Prerequisite: History 200.

HEc 405 (0-0; 3-3)

Original Apparel Design—Principles of designing clothes by draping techniques. Development of original designs and construction of the garments in appropriate fabrics. Study of the fashion industry and contemporary designers.

Prerequisite: HEc 350 and HEc 403.

HEc 407 (1-5; 0-0)

Tailoring—Specialized tailoring techniques applied to the construction of a suit or coat from a commercial pattern. Evaluation of methods used in tailored garments.

Prerequisite: HEc 203 or 307, and HEc 309.

HEc 411 (0-0; 2-4)

Advanced Textiles—Physical, chemical and microscopic analysis of textiles.

Prerequisite: HEc 311 and Chemistry 230 or the consent of the School.

HEc 424 (3-3; 3-3)

Nutrition—The chemistry and biochemistry of carbohydrates, fats, proteins, minerals and vitamins in relation to human nutrition. Laboratory studies on components of foods, preparation of meals and food preservation.

Prerequisite: Chemistry 250.

HEc 425 (0-0; 3-3)

Diet and Disease—Food and diet for the sick. Description of various diseases and the role of diet in managing them.

Co-requisite: HEc 458 or HEc 424.

HEc 427 (3-3; 0-0)

Experimental Foods—Advanced study of chemical and physical principles involved in the preparation of baked products.

Prerequisite: HEc 221 and Chemistry 250.

HEc 429 (0-0; 3-3)

Advanced Experimental Foods—Study of recent developments, and of objective and subjective tests in food research. Conducting and reporting individual experiments.

Prerequisite: HEc 427

HEc 455 (3-0; 0-0)

The Family—The history of family life; family relationships; standards of living; household production.

HEc 458 (3-3; 3-3)

Nutrition—The principles of nutrition applied to feeding of individuals and of the family group under normal conditions. Diets for special cases.

Prerequisite: Biochemistry 300.

HEc 459 (3-3; 0-0)

Methods of Presentation—Study of methods of presenting the subject matter of household economics; practice in using these methods.

HEc 461 (3-3; 0-0)

Institution Management I—Operational techniques and special problems encountered in the food service industry.

HEc 463 (0-0; 3-3)

Institution Management II—Application of principles of management to the food service industry.

MICROBIOLOGY

Micrb 201 (3-3; 0-0)

Elementary Microbiology—General microbiology; the importance of microorganisms in everyday life. Demonstrations and practical laboratory exercises.

PHYSICAL EDUCATION

All first-year students are required to register in Physical Education.

PEd 228—Physical Education Staff (Women) (0-2; 0-2)

Recreational Activities—Emphasis on the fundamentals of the following recreational and fitness activities: aquatics, movement fundamentals, tennis, badminton, dance and golf.

PHYSIOLOGY

Physl 361 (3-3; 3-3)

Human Physiology—This course comprises the essentials of human physiology and the laboratory program is designed to illustrate principles of animal function.

Prerequisites: Biology 130 or 230 or Zoology 220 or 225. Chemistry 250 or 350.

XV

The Faculty of Law

INFORMATION, REGULATIONS, COURSES

INTRODUCTION

The course offered by the Faculty of Law is designed to qualify a student for the practice of law in any jurisdiction in which the Common Law prevails. It is also designed to offer training for business and government administration.

Completion of the course in the Faculty of Law at this University leads to the degree of Bachelor of Laws. The course requires a student's full time attendance for three academic years.

A graduate of the Faculty of Law who wishes to enter upon the practice of law must meet the requirements of the jurisdiction in which he desires to practise. The Province of Alberta requires the resident student graduate to article with a practising member of the Bar and serve under him for one year; at the end of this period and upon fulfilling certain other conditions he is formally admitted by a judge of the Supreme Court to the practice of Law in this province.

Students in the Faculty have the opportunity to prepare and submit articles for inclusion in the Alberta Law Review. The Review, published annually by an editorial board of students advised by members of the Faculty, circulates widely among members of the profession in Alberta and in other provinces and abroad.

ADMISSION REQUIREMENTS

The entrance requirement of the Faculty of Law is:

(a) Either the degree of B.A. or an equivalent degree as accepted by the Committee on Admissions, or

(b) the completion of two years of the combined B.A., LL.B., course as offered by the University.

The matriculation requirements for the combined course are the same as for the B.A. program, namely:

(a) a High School Diploma with

(b) "B" or higher standing in English 30, Social Studies 30, Mathematics 30, French 30 or German 30 or Latin 30 (or another approved language at an equivalent level) and *two* of Chemistry 30, Physics 30, Biology 30 (or 32 if taken before September, 1965), a second approved Grade XII language; and

(c) an average in these six courses of at least 60%.

Students who have completed matriculation in accordance with the requirements set forth in previous calendars should submit two transcripts of their high school record to the Registrar of the University for evaluation.

These general regulations nothwithstanding, the University may in its discretion refuse admission to any applicant.

An applicant holding a B.A. or an equivalent degree is not automatically entitled to admission to the Faculty of Law. The whole record of each applicant is examined by a Committee of the Law Faculty Council which has power to decide whether he shall be admitted. A weak academic performance is a basis for refusal.

APPLICATIONS

Students planning to enter first year Law, *excluding those in the combined course of Arts and Law,* should apply for admission on or before August 3. whether they have previously attended this University or not. Where possible they should also arrange for a personal interview with the Dean of the Faculty before that date.

Students who have successfully completed the second year of the Combined Course need not make application. They will receive from the Dean of Law a letter confirming their eligibility to enter first year of law.

PROMOTION

In the case of a student adversely affected by these regulations the Faculty Council takes into consideration all circumstances within its knowledge which might justify any deviation from the regulations.

1. The pass mark in each subject is a grade point of 4, except where otherwise specified.
2. Students in the combined course are required to secure a grade point average of 5 in each of the first two years. In addition, they must obtain a grade point of 6 in at least four courses, two of which must be for the second year, before promotion to the third year of the combined course is permitted.
3. Students in each of the three years in Law are required to obtain a grade point average of 5 on the whole of the work of the respective years. If such an average is not obtained by any student in any year, such student will be required to repeat the whole of the work of that year before taking more advanced work.
4. All students for the degree of LL.B. may be required by the Faculty to pass a viva voce examination at the end of the third year. Such an examination would be of a general character covering the work of the three years.

Students taking the combined course of B.A., LL.B. are referred to the calendar of the Faculty of Arts and Science for the regulations which apply to students under its jurisdiction.

DETAILS OF THE PROGRAM FOR THE DEGREE OF BACHELOR OF LAWS

All students in first and second years will take part in a moot court argument.

All students in third year will participate as judges in first-year moots.

NOTE: The hours of instruction for both terms of the winter session are shown at the top of each descripion. The first figure in each term indicates lecture-hours and the second laboratory-hours.

Staff of the Faculty

Professors—W. F. Bowker (Dean), A. Smith, A. R. Thompson
Associate Professors—I. L. Head, Miss P. J. Coffman, S. P. Khetarpal, E. W. S. Kane (Secretary of the Faculty), Frank Jones, Keith Sellar
Assistant Professors—D. T. Anderson, M. J. Sychuk, J. Williams
Sessional Instructors—J. Brumlik, P. Herring, D. C. McDonald, A. F. Moir, J. B. Ritchie, Wm. Stevenson

First Year

Law 400—A. R. Thompson, D. C. McDonald, P. J. Coffman (3-0; 0-0)

Introductory Course—An introduction to the nature and scope of law with reference to the main divisions of English law, the growth of common law and equity, the sources of the law and the doctrines of precedent and principal rules of statutory construction. The forms of action at common law and the history of pleading are studied together with a brief examination of modern procedures. A study is made of the Courts of Alberta and the Federal Courts, the growth of legal professional literature and the development of the courts in England and Canada.
Selected Readings.

Law 401—A. Smith, J. Côté (3-0; 3-0)

Contracts—Formation of contract. Intention to create legal obligations. Certainty or ascertainability of terms. Offer and acceptance. Extent to which acceptor bound by conditions of which he is not aware. Genuineness or reality of consent. Consideration. Parties. Impossibility of performance. Discharge of contract.

Milner, *Cases and Materials on Contracts;* Cheshire and Fifoot, *Cases on the Law of Contract;* Anson, *Principles of the English Law of Contract;* Cheshire and Fifoot, *The Law of Contract.*

Law 402—W. F. Bowker, J. Williams (4-0; 4-0)

Torts 1—Intentional interference with the person and with land and chattels; the defences thereto; negligent interference with person and property and the defences thereto; contributory negligence and assumption of risks; death in relation to tortious liability; liability of occupiers of land.
Wright, *Cases on the Law of Torts,* 1963; Selected Readings.

Property 1

Law 403 (4-0; 2-0)

(a) *Real Property*—D. T. Anderson—(2-0; 2-0)—The historical background of land in Alberta: in particular, tenure and estate, future interests, concurrent interests, dower rights and incorporeal interests. The Torrens systems is related to the land law by a general introduction to the subject of land registration.
Cheshire, *Modern Real Property;* Megarry and Wade, *Law of Real Property;* Laskin, *Cases and Notes on Land Law.*
(b) *Personal Property*—Ivan L. Head, Keith Sellar—(2-0; 0-0)—The nature of chattels and the means by which a property interest in them may be acquired, retained, modified and severed.
Crossley Vaines, *Personal Property;* Selected Cases and Readings.

Law 404—S. P. Khetarpal, M. J. Sychuk (2-0; 2-0)

Criminal Law—A study of the substantive law of crimes. Consideration of general common law principles and their relevancy to the Criminal Code of Canada is followed by a review of selected offences under the Code. Special problems such as "constructive" murder and insanity receive particular attention.

Mackay, *Cases and Materials on Criminal Law* (1958); *Martin's Criminal Code* (1955 ed. and current annual).

Law 405—Ivan L. Head, Keith Sellar (0-0; 2-0)

Agency—The relationship of Principal and Agent. Capacity of Parties. Appointment of Agents. Married Women as Agents of their husbands. Delegation. Agents binding their Principals; Actual authority; Ostensible Authority and holding out; Contracts under Seal executed by Agents. Ratification. Undisclosed Principals. Duties of Agent to Principal. Duties of Principal to Agent. Determination of agency. Partnership.

Wright, *Cases on Agency;* Powell, *The Law of Agency;* Friedman, *The Law of Agency.*

Law 406—J. B. Ritchie (0-0; 2-0)

Criminal Procedure—Jurisdiction, procedure and powers of criminal courts. Steps from commission of crime to final adjudication on appeal at all levels of criminal jurisdiction. Crown practice. The Criminal Code of Canada, Parts XI-XXIV; Federal and Provincial Statutes; selected cases.

Second Year

Law 430—Keith Sellar (2-0; 2-0)

Evidence—The adversary system in trial and appellate courts; relevance and admissibility; character evidence including similar facts; opinion evidence; the hearsay rule and its exceptions; illegally obtained evidence; judicial notice; burdens of proof and presumptions; quantum of proof; corroboration; competence, compellability and privilege; a parol evidence rule; oaths and affirmations.

Morton, *Cases and Materials on Evidence;* Cross, *Evidence;* selected readings.

Law 431—S. P. Khetarpal 3-0; 0-0)

Trusts—A brief survey of the historical development of the trust introduces an intensive study of the specialized areas of this institution. Particular attention is given to the intricacies of charitable trusts and the following of trust assets.

Weston, *Cases and Materials on Wills and Trusts* (1957); Keeton, *Law of Trusts* (7th ed., 1957).

Law 432—F. D. Jones (3-0; 3-0)

Commercial Law—Bills and notes and sales of goods are studied intensively on the basis of the statutes, cases and texts. The case law concerning bills of sale, chattel mortgages and conditional sale contracts is examined. Creditors' rights under particular statutes including the Bankruptcy Act are treated generally with emphasis upon setting aside fraudulent conveyances, executions, seizures and suretyship.

Falconbridge, *Banking and Bills of Exchange; Benjamin on Sale;* Chalmers' *Sales of Goods;* Atiyah, *Sale of Goods.*

Law 433—J. Brumlik (0-0; 2-0)

Insurance Law—This course covers some of the general principles affecting insurance contracts including good faith, indemnity, subrogation and insurable interest and then goes on to consider in some detail particular problems arising out of The Alberta Insurance Act in relation to automobile, life and fire insurance.

U.B.C. Cases and Materials on the Law of Insurance; The Alberta Insurance Act.

Law 434—W. F. Bowker (2-0; 2-0)

Wills and Administration—Principles of the Wills Act, including formalities of execution, revocation, revival, republication, types of legacies and principles of construction. Testamentary capacity, fraud and undue influence. Drafting of wills. Appointment of executors and administrators, their powers and duties; probate practice.

Theobald, *Wills,* 11th ed.; Jarman, *Wills,* 8th ed.; Bailey, *Wills,* 3rd ed.; Mustoe, *Executors,* 4th ed.; Widdifield, *Executors' Accounts.*

Law 435—A. Smith (2-0; 2-0)

Canadian Constitutional Law—Principles applicable to proceedings by and against the Crown and its agencies, including declaratory judgments. The British North America Act, particularly the division of legislative jurisdiction between Parliament and the Legislatures. Relevant comparisons with the Constitution of the United States.

The British North America Act; selected cases and statutes; Laskin, *Canadian Constitutional Law;* Varcoe, *Legislative Power in Canada;* Smith, *The Commerce Power in Canada and the United States.*

Law 436—S. P. Khetarpal (0-0; 2-0)

Domestic Relations—Promise to marry and breach thereof. Marriage as a contract. Marriage as a status. Presumption of valid marriage. Void and voidable marriages: minors; mental incapacity; mistakes; duress; degrees of affinity and consanguinity; impotency. Divorce. Judicial separation. Cruelty. Condonation. Collusion.

Smith and Guttman, *Cases and Materials on Domestic Relations.*

Law 437—D. T. Anderson (2-0; 0-0)

Torts 2—Strict liability; defamation; deceit; interference with advantageous relations; also the law of master and servant with particular reference to the law of torts.

Wright, *Cases on the Law of Torts,* 1963

Law 438—D. C. McDonald (0-0; 2-0)

Administrative Law—This course is designed to provide a practical appreciation of the administrative process in relation to its judicial counterpart. As well as studying the customary areas of delegation, characterization of function, natural justice, judicial review and remedies, the student will participate in a project requiring study of a particular administrative tribunal.

Angus, *Cases and Materials on Administrative Law* (1962); de Smith, *Judicial Review of Administrative Action* (1959); Griffith and Street, *Principles of Administrative Law* (2nd ed., 1957).

Third Year

Law 460 (2-0; 2-0)

Real Property 2—

(a) (0-0; 2-0)—D. T. Anderson—The law relating to land titles. Thompson, *Cases and Notes on Land Titles;* Thom, *Canadian Torrens System.*

(b) (2-0; 0-0)—A. F. Moir—The law governing agreements for sale of land: the open contract of sale; implied terms; special covenants in agreements for sale. Remedies of vendors and purchasers; election of remedies; cancellation and determination clauses. Deposits and instalments. Mortgages: legal, equitable and statutory. Foreclosure; sales; redemption; possession and attornment. McCaul, *Remedies of Vendors and Purchasers;* Falconbridge, *Law of Mortgages.*

Law 461—Wm. Stevenson (2-0; 0-0)

Equity—Historical introduction. Nature of Equitable Rights. Priorities: *Bona Fide* Purchaser for value without Notice: *Qui prior est tempore potior est jure,* and the rule in Dearle v. Hall. Doctrines of Conversion, Election, Performance, Ademption and Satisfaction. Mistake, Misrepresentation, Fraud, and Undue Influence. Penalties and Forfeitures. Restrictive Convenants. Injunctions. Specific Performance. Mutuality. Part Performance.
Smith and Read, *Cases on Equity;* Maitland, *Equity;* Hanbury, *Modern Equity;* Snell, *Principles of Equity.*

Law 462—Keith Sellar (2-0; 2-0)

Practice—A study of the fundamentals of judicial procedure: the jurisdiction of the courts, and the process of the courts. A portion of the course consists of clinical sessions and observation in court of the several forms of judicial hearings.
Rules of Court.

Law 463—W. F. Bowker, J. Williams (1-0; 1-0)

Recent Cases and Legislation—Students are given a series of practical problems, usually involving statute law as well as case law, and are required to give an opinion or write a brief. Stress is laid on the technique of research and of writing; certain recent cases are critically examined, and relevant statutes are studied from the standpoint of statutory construction as well as content. Each student is required to write a case comment on a recent Canadian case.

Law 464—Ivan L. Head (2-0; 2-0)

Company Law—A study of the law of partnerships, unincorporated associations and limited liability companies. The incorporation of companies will be examined as will relationships between the company and outsiders and relationships of the members of the company within the corporate structure.
Gower, *Modern Company Law;* Selected Cases and Readings.

Law 465—A. Smith (0-0; 2-0)

Conflict of Laws—Characterization. Domicile. Choice of law: Penal, revenue and procedural law, public policy; Marriage—form, capacity; Succession—moveables, immoveables; Restrictions on power of testamentary disposition; Revocation of a will by subsequent marriage; Proprietary rights of spouses;

Legitimacy; *Legitimatio per subsequens matrimonium;* Adoption of infants; Torts; Contract. The doctrine of the *renvoi.* Jurisdiction: General; Divorce; Nullity of marriage; Custody of infants.

Castel, *Cases of the Conflict of Laws;* Falconbridge, *Cases on the Conflict of Laws;* Morris, *Cases on Private International Law;* Dicey, *The Conflict of Laws;* Cheshire, *Private International Law;* Falconbridge, *Essays on the Conflict of Laws;* Castel, *Private International Law;* Graveson, *The Conflict of Laws;* Wolff, *Private International Law.*

Law 466—M. J. Sychuk (2-0; 2-0)

Jurisprudence—The philosophy of law, including the natural law, historical, positivist and sociological viewpoints. The analysis of law, including classification and sources, and legal concepts such as rights and duties, negligence, personality, property and possession. The study of law on the basis of interests. Paton, *Jurisprudence;* Friedmann, *Legal Theory;* Stone, *The Province and Function of Law;* Salmond, *Jurisprudence.*

Law 467—F. D. Jones (2-0; 2-0)

Taxation—The scope and purpose of taxation. The taxing power: constitutional problems. Personal jurisdiction. Property jurisdiction. Statutory interpretation. Problems of death duty legislation. Gift tax. Income tax: general principle;income from services, property and business; deductions, receipt and measurement of income.

LaBrie and Sherbaniuk, *Cases and Material on Taxation;* LaBrie, *Introduction to Income Tax Law—Canada;* Dominion Succession Duty Act, Estate Duty Act, Income Tax Act.

Accounting 270—Percy Herring (2-0; 2-0)

Legal Accounting—The first portion of the course will cover the introduction to the principles and mechanics of accounting as required by the Alberta Bar Society covering accounts of practising lawyers. This will entail instruction in double entry bookkeeping principles, general maintenance of books for law offices, maintenance of books for recording of trust funds, control of disbursement of funds, and preparation of income and expense statements and balance sheets.

The second section of the course will include examination of the application of accounting principles in the various areas of income taxation, company and municipal law, management of estates, bankruptcy and winding up procedures.

Seminars

A number of seminars will be offered. Each student will enrol in one of them. Consideration will be given to the student's preference but allocation will be made to avoid large classes.

The following seminars will be offered.

Law 492—A. M. S. Melnyk (2-0; 2-0)

Seminar in Labour Law—A study of various areas of labour law, including: unfair labour practices, the legality of strikes and picketing, certification, the nature of a collective agreement, the duties of a union to the bargaining unit. A paper will be required of each student.

A. W. R. Carrothers, *Collective Bargaining Law in Canada;* B. Laskin and H. W. Arthurs, *Cases and Materials on Labour Law.*

Law 493—F. D. Jones (2-0; 2-0)

Seminar in Estate Planning—A study of arrangements for the disposition of accumulated wealth during life and at death. Consideration is given to such factors as the impact of income estate and gift taxes in shaping the form of dispositions, the functions of life insurance in family and business arrangements, and the significance of variations in the disposer's family and business circumstances and in the nature and value of his assets.

Law 590—A. Smith (2-0; 2-0)

Seminar in Advanced Problems in Constitutional Law.

Law 591—A. R. Thompson, M. J. Sychuk (2-0; 2-0)

Seminar in Problems in Oil and Gas Law.

Law 592—Ivan L. Head (2-0; 2-0)

Seminar in International Law.

Law 594—S. P. Khetarpal (2-0; 2-0)

Seminar in Comparative Law.

(For course descriptions see under Heading Graduate Studies, post).

GRADUATE STUDIES

Master of Laws

1. Candidates who are graduates of this or some other university with an LL.B. or equivalent degree and who meet the requirements for admission of the Faculty of Graduate Studies in other respects, may be admitted to a program of study in the Faculty of Law leading to the degree of Master of Laws.
2. The program of study, which must be approved by the Dean of the Faculty of Law, will include both courses and research, a minimum of four course hours per week for two terms being required in the ordinary case. A thesis is required in addition to the course work and research. Courses of study are available only in specialized fields. Inquiry should be addressed to the Faculty of Law as to which courses will be offered in any year.
3. The general regulations for graduate studies and, in particular, the regulations governing fees, scholarships and assistantships, admission and thesis requirements are set out in the calendar of the Faculty of Graduate Studies.
4. *Graduate Courses:*

Law 590—A. Smith (2-0; 2-0)

Seminar in Advanced Problems in Constitutional Law—The purpose of this Seminar is to enable and require the participants to conduct intensive, specialized studies in topics in Canadian Constitutional Law which have current or future significance but which were either not treated or, if treated, not emphasized in the subject in the second year. Each participant, during the Session, will prepare, deliver and defend a major paper on a topic chosen by him and approved by the instructor.

Law 591—A. R. Thompson (2-0; 2-0)

Seminar in Problems in Oil and Gas Law—A study of legal problems relating to the nature of the interest in oil and gas *in situ* and under the various dispositions encountered in Canada; the rights and duties of the parties under the typical oil and gas lease; development obligations; the impact of legislation and particularly the Oil and Gas Conservation Act. Students are required to present papers on such legal problems.
Reference: *Canadian Oil and Gas,* Lewis and Thompson; United States textbooks, reviews and cases; related statutes.

Law 592—Ivan L. Head (2-0; 2-0)

Seminar in International Law—A consideration of the sources of international law and its application in the relations of States. Problems of territory, nationality, trade, and international obligation will be examined with emphasis upon those characteristics peculiar to Canada's geography, history, governmental structure, and external relationships. A paper will be required of each student.
References: Brierly, *The Law of Nations* (4th Ed.); Castel, *International Law.*

Law 594—S. P. Khetarpal (2-0; 2-0)

Seminar in Comparative Law—A comparison of civil law and common law systems with the Quebec example serving as the focal point for discussion and examination. The seminar concerns itself with particular illustrations from which to draw general conclusions. Its object is to broaden the common law horizon by providing an insight into the workings of the civil law.
Castel, *The Civil Law System of the Province of Quebec.*

Law 601—A. R. Thompson (2-0; 2-0)

Seminar in Comparative Petroleum Legislation—A comparative study of the legislative framework regulating the development of petroleum resources in various parts of the world. Particular attention is given to the role of legislation in the granting of exploration and development rights in state-owned land, in stimulating production, in maximising revenues, in minimising interference with state sovereignty, in conserving oil and gas resources, and in regulating the multiple use of surface land.

Diploma in Petroleum Law

The Faculty of Law is authorized to award a Diploma in Petroleum Law. Admission to the diploma course is available to those qualified in law by universities, institutions of learning or professional societies in any part of the world, whose qualifications are approved by the Faculty. In particular, the diploma course is available to graduates in the civil law or in other systems of law whose backgrounds do not qualify them for the Master of Laws degree. A working knowledge of the English language is required. The program of studies includes courses in petroleum law and related fields, together with research, as approved by the Faculty of Law. In addition, a thesis may be required or not, depending on faculty assessment of the candidate's qualifications. The awarding of the diploma depends on completion of requirements to the satisfaction of the Faculty of Law.

THE COMBINED COURSE OFFERED FOR THE DEGREES OF BACHELOR OF ARTS AND BACHELOR OF LAWS

First Year

English 200; French 200 or German 200 or Latin 200; a science or mathematics or statistics course; two of Economics 200, History 200, Philosophy 240 or Political Science 200; Physical Education.

Second Year

Five approved Arts courses (See "Notes" below.)
(No student may enter the second year of the combined course unless he has successfully completed the first with an average of not less than 60%.)

Third Year

The prescription for first year Law; one approved senior Arts course. (Promotion from the second to the third year of the combined course is contingent upon an average of at least 60% in the second year and second class standing in at least four courses, two of which must be in the second year. Students eligible to enter the third year will be notified by the Dean of Law.)

Fourth Year

The prescription for second year Law.
(The degree of B.A. may be granted at the end of the fourth year.)

Fifth Year

The prescription for third year Law.

Until his third year of the combined course, the student is under the jurisdiction of the Faculty of Arts. In the third year (his first year of Law) the student is primarily under the jurisdiction of the Faculty of Law but remains under the partial jurisdiction of the Faculty of Arts. Prospective Law students are invited to consult the Dean of the Faculty of Law for advice as to the selection of options or for advice on any other problem.

Notes on B.A.-LL.B. Course Selection

1. The courses of the first two years of the combined program must include a major concentration of three courses in one of Economics, English, History, Philosophy or Political Science, and a minor concentration of two courses in a second subject, not necessarily one of these.
2. The program must include at least one approved course in either Canadian History or Canadian Government, and at least one approved course in British Constitutional History or British Government; these courses may, but need not, be included in either the major or minor concentration.

XVI

The Faculty of Medicine

INFORMATION, REGULATIONS, COURSES

(1) INTRODUCTION

The Faculty of Medicine offers the following degree programs:

(a) **The program leading to the Degree of Doctor of Medicine (M.D.)**

The Faculty provides a complete and fully accredited four year medical training program leading to the Degree of Doctor of Medicine. Each year contains 33 weeks of instruction. The first two years are devoted to a study of the basic medical sciences and to an introduction to clinical medicine. The final two years, which are conducted on a quarter or trimester system, are devoted to clinical study and experience in the hospitals associated with the Faculty.

(b) **The Program leading to the Degree of Bachelor of Science in Medical Laboratory Science (B.Sc. (M.L.S.))**

The Faculty conducts a four year program leading to the Degree of Bachelor of Science in Medical Laboratory Science which is intended to qualify selected applicants for positions as Laboratory supervisors or senior technologists and to meet the special requirements of medical science laboratories. The third year of the program includes a 12 month period of practical laboratory training under the direct supervision of the Faculty of Medicine.

Students are eligible, at the end of the third year of the program, for the examinations of the Canadian Society of Laboratory Technologists.

(c) **A program leading to the Degree of Bachelor of Science in Medicine (B.Sc. (Med.))**

A one year program of study in a branch of medical science leading to qualification for the Degree of Bachelor of Science in Medicine may be undertaken either at the completion of the second year of the medical program or following graduation in medicine. The work for this degree may be carried out in any department of the Faculty of Medicine, but may not be taken concurrently with any part of the medical curriculum nor by a student carrying any condition in his medical program.

Further information may be obtained from the Dean of Medicine or the Registrar.

In addition to these degree programs the following programs are conducted:

(1) **Graduate Studies**

Programs leading to the degree of Master of Science or Doctor of Philosophy in any of the basic medical sciences and in experimental medicine and in experimental surgery are conducted under the direction of the Faculty of Graduate Studies. These programs are open to graduates in medicine of this or any other approved medical school who conform to the requirements and regulations of the Faculty of Graduate Studies. See calendar of the Faculty of Graduate Studies.

(2) **Graduate Training in Medical and Surgical Specialties**

A graduate training program leading to eligibility for specialist qualification by the Royal College of Physicians and Surgeons of Canada is offered in the following clinical specialties.—

Anaesthesiology, Bacteriology, General Surgery, Internal Medicine, Neurology, Neurosurgery, Obstetrics and Gynaecology, Ophthalmology, Orthopedic Surgery, Otolaryngology, Paediatrics, Pathology, Physical Medicine and Rehabilitation, Psychiatry, Radiology (Diagnostic), Radiology (Therapeutic—2 years), Thoracic and Cardiovascular Surgery, and Urology.

In all specialties clinical training takes the form of successive residency appointments with increasing responsibility, during which seminar and directed reading programs are conducted covering the scope of the specialty.

Undergraduate teaching forms part of the duties of senior trainees.

These graduate training programs are open to suitably qualified graduates who are eligible for the educational register of the College of Physicians and Surgeons of Alberta. For foreign medical graduates this necessitates possession of the E.C.F.M.G. certificate or its equivalent.

Enquiries regarding graduate training in clinical specialties should be directed to Chairman, Committee on Graduate Training, Faculty of Medicine, University of Alberta.

(3) **Continuing Medical Education**

A program of postgraduate courses and regional, hospital-based conferences, is organized by the Department of Continuing Medical Education, in close co-operation with the Canadian Medical Association, Alberta Division ,and the College of General Practice, Alberta Chapter. The Department also undertakes to provide in-hospital experience for those practising doctors who wish to take advantage of this type of learning opportunity. The objective of the Department is to assist and encourage doctors engaged in the clinical practice of medicine, to keep abreast of recent advances in medical knowledge and technology.

Students' Expenses

Instruction and general fees are listed in the general section of this calendar. In addition undergraduate medical students are required to spend $100 to $150 each year for books, supplies and equipment.

The four academic years in the M.D. course will necessitate, on the average, an estimated total expenditure by each student of approximately $7,200 which includes tuition and fees, board and room, books and supplies, and all other personal expenses.

Funds are available as loans or grants to undergraduate medical students as outlined in the Awards and Financial Assistance section of this calendar.

Medical Undergraduate Society

Upon the unanimous request of the students, the Board of Governors has authorized the collection of a fee from every student in Medicine for the Medical

Undergraduate Society, by which such student acquires membership. The society looks after certain social and cultural activities for the medical students and represents them in various connections, including that of the Canadian Association of Medical Students and Internes.

Associated Hospitals

The main teaching Hospital of the Faculty of Medicine is the University of Alberta Hospital, (1,200 beds) which is adjacent to the Campus. This Hospital is closely associated with the Faculty under a Health Sciences Center Co-ordinating Council.

The Clinical Departments, clinical teaching facilities, and special services and research facilities of the Faculty are contained in the University of Alberta Hospital.

Clinical Teaching Units are maintained in the Royal Alexandra Hospital (790 beds) with which the Faculty is affiliated.

By special arrangement undergraduate and graduate programs are also conducted in the following Hospitals associated with the Faculty: Misericordia Hospital (425 beds); Edmonton General Hospital (530 beds); Charles Camsell Hospital; Alberta Hospital, Ponoka; Alberta Hospital, Edmonton and Aberhart Memorial Sanatorium, Edmonton.

University of Alberta Surgical-Medical Research Institute

The University of Alberta Surgical-Medical Research Institute, a division of the Department of Surgery, offers facilities for members of the clinical faculty in the field of experimental medicine.

Facilities are also available for research fellows in clinical departments to conduct projects under the supervision and direction of the Faculty.

The Institute offers a one trimester post-graduate course in experimental surgery.

University of Alberta Cancer Research Unit

Established in cooperation with the Canadian Cancer Society and the University, the Unit is housed in the Dr. John S. McEachern Cancer Research Laboratory. It is one of four such units located by the National Cancer Institute in Canadian medical schools.

Several postdoctoral research fellowships, for which application may be made to the Director, will be available each year.

Requirements for License to Practise.

After graduates of the University of Alberta have satisfactorily completed a year's interneship in a hospital approved by the faculty, they are entitled to be licensed by the College of Physicians and Surgeons of this province without further examination and are eligible for provincial registration. To become licensed in any other province of the Dominion, it is necessary, however, either to write the provincial examinations of the licensing body in the province concerned or to gain the qualification of the Medical Council of Canada. The latter carries the right to register in any province provided all the educational requirements of the licensing body of that province are met and to register with the General Medical Council of the United Kingdom.

The Medical Council of Canada holds its examinations at the University of Alberta at specified times. These examinations are held as conjoint examinations with the fourth year final examinations of the Faculty.

The Council of the Faculty of Medicine annually issues a list of hospitals at which an Internship satisfactory to the Council may be served. Copies of this list will be distributed to the graduating class and may be obtained from the Office of the Dean of Medicine. Graduates of the Faculty, who do not intern at hospitals on this list, may not be recommended for an Enabling Certificate.

For full particulars in regard to these examinations, consult the Registrar of the College of Physicians and Surgeons of Alberta.

Students who wish to take the examinations of the National Board of Medical Examiners of the United States may take the Part I examination at the end of the second year of the undergraduate program and the Part II examination at the end of the fourth year.

Registration for Practice

The holder of a license to practise must register with the professional organization in the particular province concerned. In Alberta, this is the College of Physicians and Surgeons of the Province of Alberta; for information regarding provincial registration address the Registrar of the College, Dr. W. Bramley-Moore, Edmonton, Alberta. Students who intend to practise in any other province should secure information from the provincial body concerned as early as possible in their medical course so that they may know of any special educational conditions which must be fulfilled.

Educational Register

All graduates serving an internship in the Province of Alberta are required, by provincial legislation, to be registered on the Educational Register of the College of Physicians and Surgeons of Alberta. This registration permits the practice of medicine within the hospital designated on the registration. Graduates serving as hospital residents in Alberta who are not registered practitioners in the Province are similarly required to be registered on the Educational Register. Application should be made to the Registrar, College of Physicians and Surgeons of Alberta from whom full particulars may be obtained.

(2) ADMISSION REQUIREMENTS

M.D.

The basic requirement for admission to the Faculty of Medicine is the satisfactory completion (after senior matriculation) of at least two years of university work approved by the Medical Faculty, including full university courses in organic chemistry, inorganic chemistry, physics and zoology (or biology).

Although these four science courses are prerequisites for entrance into the Medical Faculty no special consideration will be given to applicants having other science courses. All students are urged to take the program that they find most interesting, that will still give them these prerequisites.

The requirements can be met in various degree patterns in different faculties.

For information, the Registrar should be consulted.

Owing to limited facilities for instruction it has been found necessary to restrict the number of candidates accepted for entrance into the first year of medicine. Consideration for admission under this quota will be given only to those students who have an over-all average of at least 65% (or equivalent Grade Point Average) in the work of all preceding university years. While admission to Medicine is based largely on academic standing, the lack of essential personal qualities in an applicant may be deemed sufficient cause for refusal of admission. It should be further noted that any student whose work is unsatisfactory to the Faculty will not be permitted to continue in the study of medicine.

All students who wish to enter the first year of Medicine are required to make application to the Registrar on or before April 1. It is desirable that candidates should arrange a personal interview with the Dean or his appointee.

All applicants are required to sit the Medical College Admission Test. This test which is designed to measure general academic ability, general information and scientific knowledge is prepared under the auspices of the Association of American Medical Colleges and is conducted on campus by the Students Counselling Service in October of each year. An application to take this test together with a fee of $15.00 must be sent direct to the Psychological Corporation, New York, before October the 8th, 1965 for the 1965 examination. Details and application forms may be obtained from the Office of the Dean of Medicine.

All successful applicants are required upon acceptance of a position in first-year Medicine to make a deposit of $25.00 to the Bursar of the University. This deposit will be applied on first-year fees when the student registers in the ensuing term. Should a candidate withdraw after once accepting a position this deposit will be forfeit.

B.Sc. (M.L.S.)

The requirements for admission are as follows (students from outside Alberta must satisfy the Registrar that their training is equivalent to that required of Alberta students):

(a) A High School Diploma with

(b) "B" or higher standing in the following Grade XII examination subjects:

1. English 30
2. Social Studies 30
3. Mathematics 30
4. Chemistry 30
5. & 6. Two of
   - Physics 30
   - Biology 30 (Biology 32 will be accepted if taken before September, 1965)
   - French 30 or German 30 or Latin 30 or Ukrainian 30 (or another language at equivalent level)

(c) an average in these courses of at least 60%.

(d) Candidates must have satisfactory personality and physique and must meet the health and physical requirements of the University of Alberta Health Services.

(e) All candidates are required to have a personal interview before their application can be considered complete.

Owing to limited facilities for instruction it has been found necessary to restrict the number of candidates accepted for entrance into the first year of the program.

A fee of $5.00 is charged for evaluation of documents issued by Canadian educational institutions outside Alberta and a fee of $10.00 for documents issued by educational institutions outside Canada.

General

These general regulations nothwithstanding the University may in its discretion refuse admission to any applicant. For example this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements at the University of Alberta.

(3) PROMOTION AND GRADUATION

Examination Results

The Council of the Faculty of Medicine approves the principle that the means of assessing a student's progress and the determining of grades may vary from one department to another according to the type and nature of the course. Factors other than examination results may be used to a variable extent by instructors in determining grades but students will be informed at the commencement of the course that such measures will be employed.

First-class standing: 80%* or over.
Second-class standing : 65% to 79%.
Third-class standing: 50% to 64%.
Pass marks: 50% in each subject. A general average of 60% is required for students in the M.D. and B.Sc. (M.L.S.) programs.

For the purpose of reaching an average mark in the work of each year in the M.D. course a scheme for determining a weighted average has been adopted. A notice outlining the basis on which this is done will be posted during the session.

Supplemental Examinations

(a) Supplemental examinations for M.D. students are conducted by the University in mid-August of each year and for B.Sc. (M.L.S.) students in late August or early September. A student who has failed any course in the preceding session and who has been granted a supplemental examination may apply to the Registrar not later than the specified date for permission to write it.

M.D.:

Under no circumstances will any student who has written final examinations be permitted to sit for a supplemental examination unless he has attained an average of at least 60%* on the year's work including the failed subject or subjects. Any student neglecting to take or failing to pass a supplemental examination will not be allowed to proceed.

B.Sc. (M.L.S.):

Failure to pass a supplemental examination will necessitate repeating either that course or the whole year at the discretion of the Faculty Council.

(b) **Pass mark:** The pass mark for supplemental examinations is 50%* in all courses.

(c) **Illness:** A student who has missed a final examination because of illness may apply (providing that the application is supported by a satisfactory medical certificate) for a deferred final at the time set for the supplemental examinations in his course. A student who cannot take a Christmas final examination because of illness will be granted a deferred final examination at the end of the session; application for such an examination must be made by the deadline appearing in the Academic Schedule.

Promotion, M.D. Course

Because facilities for instruction are limited it is necessary to ensure that no unsatisfactory student shall usurp a place that could be filled by a deserving one; consequently no one will be allowed to repeat the first year of medicine unless under special circumstances deemed adequate by the Faculty. Moreover, to maintain a proper standard, a student will not be allowed to proceed to any subsequent year of medicine untill his present year is fully completed with an average mark of at least 60%*.

A student permitted to repeat a failed year who fails to produce a satisfactory record in his first term examinations in the repeated year will be required to withdraw from the Faculty and will be denied further registration in the Faculty.

Except in very unusual circumstances a student, who is repeating either first or second year of the Medical Faculty, will be required to withdraw unless his over-all average in the repeat year is at least 65%*.

***Note:** A revised grading system may be introduced during the 1966-67 session. Admission, promotion and graduation requirements will be revised to conform with the new system during the session.

Requirements for Graduation, M.D. Course

The course leading to the degree of M.D. involves four years of study in the Faculty of Medicine, following which a twelve-month period of interneship must be served in an approved hospital.

To receive the degree of Doctor of Medicine, a student must be at least 21 years old and of good moral character. At least the fourth academic year of medical study must have been spent at this University and all university dues must have been paid. In addition to complying with the requirements for admission and completing the required work of the curriculum, each candidate for the degree of Doctor of Medicine must have been recommended to the General Faculty Council for graduation. The University reserves the right to withhold the granting of the degree of M.D. until the required period of interneship has been completed and approved.

Requirements for graduation include moral and personal as well as educational qualifications, and completion of the formal requirements does not necessarily entitle a candidate to a degree from the University of Alberta. The Faculty bases its recommendations on considerations of character and of ability, attainment and worthiness in general, as well as on the completion of the required subjects in the curriculum.

(4) GRADUATE STUDY

Degree of M.Sc. or Ph.D.

By enrolling in the Faculty of Graduate Studies, a medical student holding the degree of B.A. or B.Sc., or a graduate in Medicine, may take special work in a branch of medical sciences to qualify for the degree of M.Sc. or Ph.D. See the Calendar of the Faculty of Graduate Studies.

Research

The laboratories of the basic science and clinical departments are open to those who are qualified to undertake investigations. Qualified students may work toward the degrees of B.Sc., M.Sc., or Ph.D. in these subjects. Due to limitation of facilities, such cases will be decided in the light of circumstances at the time. For further information, apply to the head of the department concerned.

(5) PROGRAMS OF STUDY AND DETAILS OF COURSES

The Program Leading to the Degree of Doctor of Medicine

(Details will be found under departmental headings.)

Note: A major revision of the program is being undertaken and certain changes from this calendar will be introduced prior to the 1966-67 session. Details will be announced.

FIRST YEAR

Subjects		Total Hours of Instruction
Gross Anatomy and Development	Anat. 411	350
Histology and Neuroanatomy	Anat. 413	275
Biochemistry	Biochem. 411	198
Physiology	Physiol. 411	235
Orientation to Medical Practice	Orient. to Med. Prac. 411	66
Psychiatry	Med. Psych. 441	44
	Total	1168

SECOND YEAR

Subjects		Total Hours of Instruction
Anthropology	Anat. 421	15
Applied Anatomy	App. Anat. 421	82
Bacteriology	Bact. 421	198
Biochemistry (clinical)	Biochem. 421	45
Clinical Pathology	Clin. Path. 421	66
Intro. to Med.	Intro. Med. 421	326
Obstet. and Gynaecology	Obst. & Gyn. 421	33
Pathology	Path. 421	198
Pharmacology	Pharmacol. 421	165
Paediatrics	Paed. 421	12
Psychiatry	Med. Psych. 421	110
	Total	1250

THIRD YEAR

Subjects		Total Hours of Instruction
Medicine	Clin. Med. 431	240
Obstetrics and Gynaecology	Obst. & Gyn. 431	130
Ophthalmology	Ophth. 431	16
Oto-Laryngology	O.L. 431	16
Pathology	Path. 431	99
Paediatrics	Paed. 431	208
Preventive Medicine	Prev. Med. 431	50
Psychiatry	Clin. Psych. 431	76
Radiology	Rad. 431	32
Surgery	Clin. Surg. 431	275
Survey of Disease	Surv. Dis. 431	256
	Total	1398

FOURTH YEAR

Subjects		Total Hours of Instruction
Anaesthesia	Anaesth. 441	34
Medicine	Clin. Med. 441	356
Medical Jurisprudence and Toxicology	Med. Jur. & Tox. 441	22
Medical Economics and Ethics	Med. Econ. & Eth. 441	11
Obstetrics and Gynaecology	Obst. and Gyn. 441	186
Ophthalmology and Oto-Laryngology	Ophth. and O.L. 441	32
Pathology	Path. 441	33
Paediatrics	Paed. 441	144
Preventive Medicine	Prev. Med. 441	16
Psychiatry	Psych. 441	186
Radiology	Rad. 441	34
Surgery	Clin. Surg. 441	256
Therapeutics	Therap. 441	33
	Total	1343

GENERAL ORGANIZATION OF THE CURRICULUM

Much of the instruction in clinical subjects is given on an inter-departmental basis and the clinical work in each year is offered as an integrated program. The various individual courses which comprise the program are listed separately in this calendar but teaching and examinations in the following courses are combined:—

Medicine I

Orientation to Medical Practice 411
Psychiatry 411

Medicine II

Introduction to Medicine 421
Psychiatry 421
Clinical Biochemistry 421
Clinical Pathology 421

Medicine III

Clinical Medicine 431
Survey of Disease 431
Psychiatry 431

Medicine IV

Clinical Medicine 441
Therapeutics 441
Medical Ethics and Economics 441

CLINICAL CLERKSHIPS

The trimester system and clinical clerkships will begin in third year. A clerkship will consist of bedside clinics, small group teaching, and the assigning of individual cases which the students must work up for themselves.

The trimesters will be divided for clerkships as follows:—

THIRD YEAR (each week contains 26 hours devoted to clerkship)

1st Trimester
Medicine—11 weeks

2nd Trimester
Surgery—11 weeks

3rd Trimester
Paediatrics—8 weeks
Obstetrics—3 weeks

FOURTH YEAR (each week contains 34 hours devoted to clerkship)

1st Quarter
Medicine—8 weeks

2nd Quarter
Surgery—8 weeks

3rd Quarter
Obst. and Gyn.—4 weeks
Paediatrics—4 weeks

4th Quarter
Medicine—4 weeks
Psychiatry—4 weeks

DETAILS OF COURSES

Interdepartmental Courses

The following courses are given by two or more departments:

Orientation to Medical Practice 411 (first year) (66 hours)

S. Greenhill, Coordinator

This course is designed to acquaint first year students with the inter-relationships of the medical, behavioural and basic sciences in the production of signs, symptoms and feelings in a patient. The lectures are given by members of the various basic science and clinical departments, as well as representatives from the behavioural sciences.

Introduction to Medicine 421 (Second Year) (326 hours)
B. J. Sproule, Coordinator

A series of lectures, theatre clinics, and bedside sessions to introduce the student to broad principles underlying disease, to the interpretation of symptoms and symptom complexes, both physical and emotional, and to attempt to demonstrate a close relationship between the two. Major divisions are Physical Diagnosis, Genetics and Statistics.

Survey of Human Disease 431 (Third Year) (256 hours)
L. E. McLeod, Coordinator

"Case centred" presentations designed to cover, in general, those diseases usually covered by departments of Surgery, Medicine, Paediatrics, and Psychiatry.

Applied Anatomy 421 (second year) (82 hours)
H. L. Richard and F. McConnell

This course gives the various aspects of Radiological and Surgical Anatomy divided as follows:—

Radiology will consist of weekly lectures in normal radiographic anatomy for one term. The second term will cover radiology including various types of radiation, production of x-rays, radiation effects, the theory of the atom, radioactive isotopes and radiation hazards; also covered will be the radiographic appearance of pathological lesions of all systems of the human body.

Surgical anatomy will consist of lecture-demonstrations by members of the department of surgery. Emphasis on surgical exposures, anatomical regions of surgical importance, and the applied anatomy of standard surgical techniques.

ANAESTHESIA

This department takes part in the teaching exercises in the Introduction to Medicine and Survey of Disease courses.

STAFF:—

Professor—E. A. Gain (Head)
Associate Professor—D. F. Cameron
Assistant Professors—J. W. R. McIntyre, F. C. Haley
Assistant Clinical Professor—N. W. Nix
Lecturers—R. I. McCalla, G. T. Moonie
Instructors—W. H. Graham, C. D. Elton, J. M. Hagen, W. D. Kyle
Sessional Instructors—R. D. Scragg, N. Soltice, R. T. Williams

Anaes 441 (fourth year) (34 hours)

One week of training in the operating room and in discussions with members of the staff of Anaesthesiology.

ANATOMY

This department takes part in the courses in Introduction to Medicine and Survey of Disease.

STAFF:—

Professors Emeritus—H. E. Rawlinson, R. F. Shaner
Professors—T. S. Leeson (Head), W. R. Salt
Associate Professors—E. G. Bertram, R. D. Laurenson
Assistant Professors—R. J. Bury, L. B. Erikson, E. Odette Hagen, K. D. McFadden, D. Ollerich,
Lecturer—J. H. Ferguson
Sessional Demonstrators—C. Farrehi, B. J. Greenhill, H. T. Ross
Honorary Members—L. Heppler, N. J. Minish, G. H. Sperber

Anat 411—R. D. Laurenson and Staff (350 hours)

Gross Anatomy and Development (first year)—Gross anatomy and embryological development of the human body.

Anat 413—W. R. Salt and Staff (275 hours)

Microscopic Anatomy (Histology and Neuroanatomy) (first year)—The minute anatomy and development of the elementary tissues and organs (about 150 hours) and the structure of the human nervous system and organs of special sense (about 100 hours).

Anat 421—R. F. Shaner (15 hours)

Anatomy (second year, Anthropology)—A brief survey of ancient man and the anatomical evidence of man's place in nature.
Prerequisite: Anatomy 411 or 412.

BACTERIOLOGY

The department of Bacteriology takes part in the presentations in the Introduction to Medicine and Survey of Disease courses.

STAFF:—

Professors—J. W. Carmichael, F. L. Jackson (Head), R. D. Stuart
Associate Professor—J. I. Payne
Assistant Professors—Anne M. Bursewicz, Sheila R. Toshach, Odosca Morgante
Lecturers—E. G. Hampton, Yvonne Goodman
Sessional Lecturer—S. I. Hnatko

Bact 421—F. L. Jackson, O. Morgante, J. I. Payne and Members of the Department (198 hours)

Pathogenic Bacteriology (second year)—The role of bacteria, viruses, fungi, and protozoa in infection and disease. Mechanisms of microbial pathogenicity and human resistance. Bacteriological procedures applicable to the diagnosis, control, and treatment of infectious disease.

Specially for students in the Faculty of Medicine, but normally open to Graduate Students and to students in Microbiology Honours pattern.

BIOCHEMISTRY

STAFF:—

Professors—J. S. Colter (Head), H. B. Collier, A. R. P. Paterson.
Associate Professors—C. M. Kay, B. G. Lane, N. B. Madsen, T. Nihei, L. B. Smillie, G. R. Schonbaum, J. F. Henderson, A. Hampton

Assistant Professors—I. C. Caldwell, C. J. Smith, Edith E. Townsend, W. Paranchych, D. J. Campbell, P. G. Barton, T. Tamaoki
Instructors—L. E. McLeod, A. G. Stewart, H. E. Bell, Joan E. Dakin
Postdoctoral Fellows—W. M. McCubbin, N. Nagabhusham, J. Wodak
Associate Member—R. F. Ruth

Bioch 411—Members of Staff (198 hours)

General Course (first year)—Structure and chemistry of the cell; acidimetry and alkalimetry; chemistry of carbohydrates, lipids, proteins and nucleic acids; enzymes; bioenergentics; digestion, absorption and intermediary metabolism of carbohydrates, lipids, proteins, and nucleic acids; mineral metabolism; vitamins; blood chemistry; chemistry of respiration.
Prerequisites: Chemistry 230, Chemistry 250.

Bioch 421—H. B. Collier and L. E. McLeod

Clinical Biochemistry—Lectures are given on selected topics in the general courses, Introduction to Medicine and Survey of Disease. The laboratory work consists of a number of projects, each involving a small group of students under the supervision of a faculty member. These projects are designed to provide intensive experience in a typical laboratory method and to encourage a critical attitude to these methods and the interpretation of the results.

COMMUNITY MEDICINE

The department of Community Medicine contributes to the teaching exercises of the clinical departments, and in the Orientation to Medical Practice, Introduction to Medicine and Survey of Diseases courses. The psycho-social, economic and preventive aspects of disease are discussed formally in lectures, and informally in seminars.

STAFF:—
Professors—Stanley Greenhill (Head), Lloyd C. Grisdale
Assistant Clinical Professor—E. S. O. Smith
Assistant Professors—Mary P. Hendrickson, C. A. Meilicke
Lecturers—T. R. Hamilton, H. L. Hogg, B.Sc., E. R. D. Haynes
Instructors—H. Brand, N. Chepeha, M. Dolgoy, A. Keleman, A. Lloyd, H. D. MacPhee,, W. G. McPhail, J. A. O'Brien, P. B. Rose, B. Snell, K. Wass, J. Willis, W. Yake
Sessional Instructors—M. J. Babiuk, D. Kelly, T. B. Letts, M. L. McMillan, M. Miller, K. Paproski, H. Schwartz, M. L. J. Segall, J. Smulski, D. M. Williamson, G. R. Zetter

PrMd 431 (50 hours)

Lecture Series (A)—These lectures are designed to acquaint students with the relationship of Health Departments at the various levels of government to the practice of medicine by the private practitioner; to illustrate the role and function of para-medical personnel and health agencies in the practice of comprehensive medical care and management of patients.

Lecture Series (B)—These lectures provide a basic course in occupational medicine, and shorter courses or individual lectures on health problems of socio-medical importance.

Family Study Programme—A learning experience to acquaint students with the complexities of medical practice and the many intangibles that contribute

to the disease of patients. Each student is assigned to a city practitioner and with guidance and individual initiative has the opportunity to assume some of the professional roles of a physician. The student so obtains first hand experience in appreciating the psycho-social and economic factors that play a role in the illness of his patient and/or family.

PrMd 441 (16 hours)

Preventive Medicine—(*A*) Contemporary Society—A course designed to indicate the role played by psycho-social-economic factors in the production of today's morbidity.

(*B*) *Medical Care*—Lecture designed to acquaint students with changing patterns of medical care.

MEDICINE AND CLINICAL MEDICINE

The Department of Medicine takes a major share of the teaching in the courses on Introduction to Medicine and Survey of Disease. The formal presentations by this department are largely limited to these courses.

STAFF:—

Professors—D. R. Wilson (Head), J. A. L. Gilbert, R. S. Fraser

Associate Professors— L. E. McLeod, G. Monckton, B. J. Sproule, S. Hunka, R. E. Rossall

Assistant Professors—D. M. Fawcett, P. M. Crockford, R. F. Taylor

Clinical Professors—J. F. Elliott, R. K. C. Thomson

Associate Clinical Professors—R. H. Whiting, A. S. Little

Assistant Clinical Professors—J. Dvorkin, D. C. Judge, F. B. Rodman, H. J. Jacobs

Lecturers—T. H. Aaron, G. I. Bell, W. Bramley-Moore, A. Cairns, E. F. Donald,R. H. Dougall, A. M. Edwards, S. E. Greenhill, E. G. Kidd, C. Lefebvre, M. Matas, J. N. Ryan, M. M. Sereda, L. Sherman, H. H. Stephens, M. K. Young

Instructors—D. M. Bell, W. Black, T. P. Broome, G. D. Brown, V. J. Campbell, R. B. Coglan, W. J. Downs, R. N. Eidem, R. A. Fleming, F. A. Herbert, J. C. Hopkyns, D. W. Irving, M. A. Jampolsky, S. Kornell, S. J. Lee, E. L. Muttit, C. G. Ramsey. O. Schaefer, R. W. Sherbaniuk, W. R. St. Clair, H. Toupin, C. J. Varvis, R. H. Wait, S. Weisz, R. H. Wensel

Clinical Instructor—S. J. K. Lee

Honorary Instructor—W. E. Pourbaix

Teaching Fellows—G. A. Grebneff, B. Ruether, A. R. Esfandiary, R. R. Singh

DERMATOLOGY

Assistant Clinical Professor—P. L. Rentiers

Lecturer—A. E. Dixon

REHABILITATION MEDICINE

Assistant Clinical Professor—

Honorary Lecturers—J. Jiminez

Instructor—P. Paez

THERAPEUTICS

Associate Professor—M. A. Mahon

Assistant Clinical Professor—J. Hilliard

Honorary Members—R. E. Bell, P. H. Sprague

Med 431—D. R. Wilson and Staff (240 hours)

Medicine (third year)—A large portion of the Survey of Diseases course will be given by the department of Medicine. Besides this the student will have a clerkship of 11 weeks in which he will do complete case history, physical examination, laboratory work and follow-up on assigned cases. There will also be bedside clinics, conferences and case presentations by the students.

Med 441—D. R. Wilson and Staff (356 hours)

Medicine (fourth year)—This is primarily a Clinical Clerkship of 12 weeks in various Edmonton Hospitals and in the outpatient department. An additional 16 hours is devoted to a reading course in this subject.

MedEc 441—W. Bramley-Moore (11 hours)

Medical Economics and Ethics (fourth year)—A short series of lectures devoted to these topics is given under the direction of the department of Medicine.

Med 441—W. A. Mahon

Therapeutics—A series of lectures on the therapy of various disease states will be given to students in their final year.

OBSTETRICS AND GYNAECOLOGY

STAFF:—

Professor Emeritus—J. R. Vant
Honorary Clinical Professor—A. Day
Professor—R. P. Beck (Head)
Associate Professor—J. W. Goodwin
Assistant Professor—W. F. Ferguson
Clinical Professor—R. H. Horner
Associate Clinical Professors—T. R. Clarke, T. R. Nelson
Assistant Clinical Professors—W. D. Frew, M. M. Hutton, S. S. Parlee, D. C. Ritchie, Y. Yoneda
Lecturers—D. M. Bell, J. A. Boyd, J. Bugis, E. B. Quehl
Instructors—J. S. Barr, L. B. Brown, D. M. Buchanan, H. J. Crooks, R. A. Day, S. W. Devine, F. R. J. Dorsey, L. J. Gans, D. H. Husel, J. R. Leeder, D. J. Moyer, R. J. Ostolosky, D. W. J. Reid, N. W. F. Weir
Sessional Lecturer—A. H. Ansari

Ob&Gy 421—R. P. Beck and Staff (33 hours)

Obstetrics and Gynaecology (second year)—This course embodies lectures in the physiology and conduct of normal pregnancy and labour, as well as an introduction to gynaecology.

Ob&Gy 431—R. P. Beck and Staff (58 formal hours; 72 clerkship hours)

Obstetrics and Gynaecology (third year)—The material for this course includes the complications of pregnancy, labour and the puerperium, as well as an expansion of clinical gynaecology, and a course in gynaecological pathology. Throughout the year, small groups of students are assigned to an obstetrical tutor. These groups meet their tutor weekly, in order to cover the curriculum, which is supplemented by formal lectures.

During each trimester, students will be assigned almost completely to the department for a period of three weeks. During this three week period, the

students attend a weekly Professorial Seminar on Monday afternoons, and two one-hour sessions on Manikin Drill each week. During this same period, the students will live in the University Hospital, to observe delivery room activity. While on the service, their tutor will act as the attending staff man on the public service. This is designed to afford a continuing contact between the students and their tutor.

Ob&Gy 441—W. F. Ferguson and Staff (186 hours)

Obstetrics and Gynaecology (fourth year)—No formal lectures are given in fourth year. Each student will act as a Clinical Clerk for a period of four weeks and will "live in" for two weeks of this time. Daily small group teaching sessions are arranged. They will attend the Out Patient Clinics in small groups during this period. A Reading Course is held on alternate Saturday mornings throughout the year.

PAEDIATRICS

The Department of Paediatrics contributes to the teaching in Orientation to Medical Practice, Introduction to Medicine, and Survey of Disease Courses as well as conducting the following teaching exercises.

STAFF:—

Professor—J. K. Martin (Head)
Associate Professors—P. Bowen, A. G. Stewart, W. C. Taylor, L. A. Stayura
Assistant Professor—
Clinical Professor—J. Calder
Clinical Professor—T. A. Gander
Assistant Clinical Professors—H. B. Armstrong, L. C. Grisdale, N. F. Duncan
Lecturers—L. E. Beauchamp, R. Poirier
Instructors—G. Conradi, G. E. Eddy, E. W. Gauk, P. J. Kimmitt, M. Mitchell, Catherine S. Lee, Jean C. Nelson, G. W. Selby, M. Tedeschini, D. Wilkinson, P. F. Wilcock
Sessional Instructors—C. E. Burchak, D. R. Shea
Teaching Fellows—C. J. Godel, C. Singh

Paed 421 (12 hours)

Paediatrics (second year)—An introduction to Paediatrics.

Paed 431—J. K. Martin and Staff (208 hours)

Paediatrics (third year)—There is a clerkship of 176 hours in which the student will be assigned cases on which he must do a complete history, physical examination and laboratory work and be prepared to present his case at any time. During this time there will also be bedside clinics and conferences.

Paed 441 (144 hours)

Paediatrics (fourth year)—During a four week clerkship in Paediatrics students will be given some patient responsibility and be under the guidance of a Preceptor.

PATHOLOGY

STAFF:—

Professor—J. W. Macgregor (Head)
Associate Professors—G. O. Bain, T. A. Kasper, S. Hanson, T. K. Shnitka, R. J. Swallow

Assistant Professors—P. W. Davey, M. M. Sereda, M. Weinlos, B. Mielke, J. H. Stirrat, A. H. Mehregan
Assistant Clinical Professor—M. M. Cantor, D. L. C. Judge
Lecturer—H. W. Letts
Teaching Fellow—D. M. Khine
Honorary Member—M. E. Hall

CLINICAL PATHOLOGY

Associate Professors—R. E. Bell, H. E. Bell
Assistant Professor—D. J. Campbell
Lecturers—D. I. Buchanan, J. R. Hill
Instructor—Darilyn A. Williams
Sessional Instructors—B. Motyl, E. Golden
Sessional Demonstrators—J. R. Hill, L. Mueller, D. Fender

BIOCHEMISTRY

Professor—H. B. Collier

MEDICAL LABORATORY SCIENCE

Assistant Professor—Jean Matheson (Co-ordinator)
Lecturers—
Instructors—Mrs. R. Cunningham, C. A. Boodram
Sessional Instructor—K. Dierich

Path 421—J. W. Macgregor and Staff (198 hours)

General Pathology (second year)—This course consists of lectures and laboratories for the full academic year. The fall term is devoted to general pathology, and the spring term to special pathology. The teaching of special pathology will be continued into the third year.

Path 431—J. W. Macgregor, M. Weinlos and Staff (99 hours)

Pathology (third year)—A series of seminars on pathological change in special organs and tissues with concurrent laboratory demonstrations of gross and microscopic pathological material.

Path 441—J. W. Macgregor and Staff (33 hours)

Pathology (fourth year)—Students will attend a clinical-pathological conference, conducted under the supervision of the Department of Pathology, for one hour each week.

MedJ 441—M. M. Cantor (22 hours)

Medical Jurisprudence and Toxicology (fourth year)—One hour per week for twenty-two weeks dealing with the criminal and civil aspects of legal medicine, and with the action of poisons.

ClinPath 421—R. E. Bell, H. E. Bell, D. I. Buchanan, B. Motyl (1-0; 1-2)

Clinical Pathology (second year)—Lectures in the selection, use and interpretation of laboratory examinations in clinical diagnosis. Hemopoietic system and kinetics of hemopoietic cell development. Study of hematological and other methods used in the clinical laboratory. Blood transfusion. Elementary helminthology.

PHARMACOLOGY

This department takes part in the teaching exercises in the Introduction to Medicine and Survey of Disease courses.

STAFF:—

Professors—E. E. Daniel (Head), C. W. Nash, G. B. Frank
Associate Professors—D. F. Cameron, W. A. Mahon, G. S. Marks
Assistant Professors—F. Inoue, D. P. MacLeod, R. J. Reiffenstein, J. D. Taylor
Lecturers—J. Christensen, P. M. Sanders
Instructors—R. I. McCalla, J. W. McIntyre

Pmcol 421—S. E. Daniel, G. B. Frank, D. P. MacLeod, W.A. Mahon, G. S. Marks, L. C. W. Nash, R. J. Reiffenstein, J. D. Taylor and Staff (165 hours)

Pharmacology (second year)—A course on the pharmological action of drugs selected for their physiological and clinical significance. The course includes a study of basic pharmacological principles as applied to representative drugs having their primary actions on various organ systems of the body. Classes of drugs studied include general and local anaesthetics; hypnotics, sedatives and anti-convulsants; analgesics; central nervous system stimulants; autonomic and curariform drugs; histamine and antihistaminics; cardiovascular drugs; diuretics; heavy metals and their antagonists; haemostatic agents and anticoagulants; chemotherapeutic agents. This course also includes work in which claims for new drugs are critically evaluated. Instruction is given in the form of lectures, demonstrations, laboratory exercises and supervised original work. Written reports covering original work are required.

Textbooks: Goth, *Medical Pharmacology*, 2nd Edition; Goodman and Gilman, *The Pharmacological Basis of Therapeutics*, 3rd Edition.

PHYSIOLOGY

STAFF:—

Professors—M. Schacter (Head), J. W. Pearce
Associate Professors—W. H. Cottle, C. Heath, E. O. Höhn, C. J. Stephens-Newsham, D. Triantaphyllopoulos
Assistant Professors—F. R. Calaresu, P. Hallet, Ruth M. Henderson, P. F. Mercer, S. M. Padsha
Lecturers—N. Clinch, Joan Gaunce, R. H. Wensel
Lecturers (part-time)—Merva M. Cottle, Mary Nursall
Research Associates—Susanne Bielenson, Jennifer Clinch
Honorary Members—Constance H. Campbell, F. C. Haley, O. Lucas, P. Lynne-Davies, R. Macnab, A. R. MacNeil, Jean Matheson, T. J. Speakman, Eugenie Triantaphyllopoulos, R. H. Wensel

Physl 441—(4-3; 4-6)—Staff (235 hours)

A comprehensive course in mammalian and human physiology for first year medical students. The lectures deal with the physical and chemical properties of living cells, the functions of organs, and the integrative physiology of the whole organism.

The laboratory course includes clinical and mammalian demonstrations.

PSYCHIATRY

STAFF:—

Professor—K. A. Yonge (Head)
Assistant Professors—J. A. Easterbrook, J. T. Gibbs, J. Guild, T. E. Weckowicz

Clinical Professors—T. C. Michie, S. S. Spaner
Associate Clinical Professor—A. R. Schrag
Assistant Clinical Professor—A. D. MacPherson
Lecturers—D. O. C. Rapier, L. J. le Vann
Instructors—H. M. Bacon, G. D. Carson, Mary A. Davis, F. J. Edwards, H. Fuerst, C. P. Hellon, Marie MacDonald, H. Pascoe, D. L. Phillips, F. Scott, Z. Selinger, J. Thompson, H. Wojcicki, B. J. Van Stolk
Honorary Member—R. R. MacLean

Psyci 441—K. A. Yonge and Staff (44 hours)

Medical Psychology (first year)—Within the framework of the integrated course "Orientation to Medical Practice", lectures are given orienting the student to the general concepts of health and disease to include the psychosocial aspects. They go on to give an outline of general psychology as applicable to the practice of medicine. There follows an outline of the psychology of human development.

Psyci 421—K. A. Yonge and Staff (110 hours)

Medical Psychodynamics and Psychopathology (second year)—Lectures in the psychodynamic mechanisms of personality, normal and pathological, the structure, function and assessment of personality, the principles of medical interviewing and psychotherapy are given within the framework of the general course "Introduction to Medicine". Supervised practice and closed-circuit televised demonstrations of medical interviewing follow the lecture program.

Psyci 431—K. A. Yonge and Staff (76 hours)

Clinical Psychiatry (third year)—54 hours of lecture-demonstrations on the nature, cause and treatment of neurotic, psychotic and character disorders are given in the general course "Survey of Human Disease". In addition, practical experience is gained in dealing with patients through small group clinics (22 hours).

Psyci 441—K. A. Yonge and Staff (186 hours)

Psychiatry (fourth year)—Experience in the clinical practice of psychiatry is gained through a one month's clinical clerkship, two weeks of which are spent at the University Hospital Department of Psychiatry and two weeks at one of the Provincial Mental Hospitals.

Textbooks:

Mowbray and Roger, *Psychology in Relation to Medicine;* Noyes and Kolb, *Modern Clinical Psychiatry,* 6th edition; Mayer-Gross, Slater and Roth, *Clinical Psychiatry;* Weiss and English, *Psychosomatic Medicine;* Gregory, *Psychiatry—biological and social;* Engel, *Psychological Development in Health and Disease;* Anderson, *Psychiatry;* D. Russell Davis, *Introduction to Psychopathology.*

RADIOLOGY

STAFF:—

Professor—F. McConnell (Head)
Assistant Clinical Professors—C. F. Hyndman, S. C. Windle
Lecturers—R. M. Clare, I. D. Hendin, C. F. Hyndman, M. Mallet
Instructors—C. E. Holmes, J. D. R. Miller, W. R. Parker, M. E. Tulloh

Radio 421—S. C. Windle and H. L. Richard (68 hours)

Applied Anatomy (second year)—For details, see General Courses.

Radio 431—F. McConnell and Staff (32 hours)

Radiology (third year)—The course consists of weekly lectures and demonstrations to students in each of the Surgical, Medical and Paediatric Trimesters.

Radio 441—F. McConnell and Staff (34 hours)

Radiology (fourth year)—Weekly lectures and demonstrations on radiological findings in the various diseases and pathological conditions will be given to the whole fourth year class.

SURGERY AND CLINICAL SURGERY

In the first year of the course representatives of the Department of Surgery are in attendance at the laboratory periods in Anatomy and Physiology in order that the application of these subjects to clinical surgery may be indicated.

In the second year of the course the Department of Surgery, including the Surgical Specialties, in association with the other clinical and preclinical departments, contributes to the integrated panel discussions and illustrative case demonstrations which constitute the course "Introduction to Medicine". This course consists of two two-hour presentations per week throughout the year. In this year also the department takes part in Applied Anatomy 421.

STAFF:—

Professors—W. S. Anderson, R. A. Macbeth (Head), W. C. Mackenzie
Clinical Professors—B. Michalyshyn, M. Weinlos, G. L. Willox, T. S. Wilson
Assistant Clinical Professors—C. A. Allard, W. F. M. Hall, A. W. Hardy, R. J. Johnston, S. Kling, M. M. Laskin, A. B. McCarten, H. L. Richard, W. A. Shandro, H. T. G. Williams
Lecturers—G. R. Boileau, G. F. Bondar, W. A. Maclean, B. Margolus, A. E. Theman, C. H. W. Weinlos
Instructors—E. S. Allin, M. Besney, R. G. Davis, M. H. W. Friedman, H. A. Hyde, W. Pawluk, W, Pisesky, J. Siegenberg, F. W. Turner, O. Thurston
Sessional Instructors—G. E. Allin, J. E. Gendron, R. M. Hackett, H. D. Hebb, R. E. Jesperson, H. Links

(EXPERIMENTAL SURGERY)
Associate Professor—K. P. Kowalewski (Head)
Consultant Pathologist—T. A. Kasper
Research Associate (Orthopaedics)—M. A. Emery

(NEUROSURGERY)
Clinical Professors—G. K. Morton, T. J. Speakman (Head)
Instructor—P. R. B. Allen
Research Associate—R. S. Smith

(OPHTHALMOLOGY)
Associate Professor— T. A. S. Boyd (Head)
Lecturer—D. L. Rees
Instructor—D. T. R. Hassard
Sessional Instructor—A. Patrick

(Orthopaedic Surgery)
Clinical Professor—O. Rostrup (Head)
Lecturers—G. W. Cameron, F. G. Day, J. L. Gulley, D. C. Johnston, J. P. Moreau, G. L. Wilson
Instructors—H. W. Bouwman, G. E. Edwards, G. C. Gray, J. Gort, R. S. Henderson, J. R. Huckell, A. H. McKenzie, R. G. Townsend

(Oto-Laryngology)
Clinical Professor—K. A. C. Clarke
Assistant Clinical Professor—T. C. Wilson
Lecturer—P. T. Quinlan
Sessional Instructors—S. J. Warshawski, R. W. Mallen

(Plastic Surgery)
Assistant Clinical Professors—J. D. M. Alton (Head), E. Hitchin
Instructors—E. W. Bissell, K. S. Clarke, H. J. Shimizu

(Thoracic and Cardiovascular Surgery)
Clinical Professor—J. C. Callaghan
Associate Professor—C. M. Couves
Lecturer—L. P. Sterns
Instructors—C. S. Dafoe, H. Meltzer, C. Ross

(Urological Surgery)
Clinical Professor—J. O. Metcalfe (Head)
Associate Professor—W. H. Lakey
Assistant Clinical Professor—R. R. Francis
Instructors—F. D. Conroy, T. C. Eid, L. Giroux, F. C. Marshall
Honorary Members—N. E. Alexander, R. L. Anderson, W. S. S. Armstrong, E. Greene, R. G. Huckell, M. R. Marshall

Surg 431—R. A. Macbeth and Staff (275 hours)

Surgery and Clinical Surgery (third year)—(1) *Theatre Clinics*: Seventy-three one-hour formal clinics, five of which are given jointly with other departments, will be presented throughout the year by the Department of Surgery, including the surgical Specialities. These theatre clinics constitute the surgical contribution to the integrated course "Surgery of Human Disease".

(2) *Lecture Demonstrations*: Throughout the eleven week Surgical Trimester one hour per week is devoted to a lecture-demonstration, in the Surgical Medical Research Institute, of surgical research currently under investigation in the department. In addition one hour per week is devoted to a lecture demonstration in surgical radiology in co-operation with the Department of Radiology.

(3) *Clinics*: Eight hours of clinical instruction per week on the wards of the University of Alberta and Royal Alexandra Hospitals will be provided by the Department of Surgery including the Surgical Specialties during the trimester the student is assigned to surgery.

(4) *Ward Work*: Sixteen hours of ward work per week will be carried out under supervision at the University of Alberta, Royal Alexandra, Misericordia and General Hospitals during the trimester the student is assigned to surgery.

Surg 441—R. A. Macbeth and Staff (256 hours)

Surgery and Clinical Surgery (fourth year)—16 hours are devoted to a reading course in Surgery. The rest of the time takes the form of an 8 week clinical

clerkship in the wards of various Edmonton Hospitals and in the outpatient department.

Ophth 431—T. A. S. Boyd and Staff (32 hours)

Ophthalmology (third year)—(a) One hour lecture per week for twenty-one weeks. These lectures include the demonstration of patients and use of instruments where applicable.

(b) Clinical ophthalmology, one hour a week for eleven weeks in the form of small group bedside clinics.

OtoL 431—K. A. C. Clarke and Staff (21 hours)

Otolaryngology (third year)—(a) One hour lecture per week for ten weeks.

(b) Clinical otolaryngology, one hour a week for eleven weeks in the form of small group bedside clinics.

Ophth 441—T. A. S. Boyd, K. A. C. Clarke and Staff (16 hours)

Ophthalmology and Otolaryngology (fourth year)—While on their Surgical Quarter students will devote two hours per week to small group clinical bedside instruction in Ophthalmology and Otolaryngology.

Graduate Course

Surg 500 (0-0; 0-3)

Experimental Surgery—This course, offered by the Department of Surgery and conducted in the Surgical-Medical Research Institute is designed to familiarize graduate students with the broad principles of biological research, the care of experimental animals and the conduct of surgical procedures under experimental conditions.

Academic Honors and Awards, M.D. Course—1965

Fourth Year M.D.

John W. Scott Award
Douglas Frederick WALLER

Moshier Memorial Medal
Morris Keith MILLER

Mewburn Memoral Gold Medal
Donald Marvin CARR

The Conn Memorial Medal
Donald Marvin CARR

The Pope Memorial Medal
Douglas Frederick WALLER

S. S. Spaner Prize
Douglas Frederick WALLER

Alberta Tuberculosis Association Prize
Not Awarded

Dr. Ernest A. Johnson Scholarship
Morris Keith MILLER

Douglas Leitch Gold Medal
Charles Herbert HARLEY

John James Ower Memorial Gold Medal
Joe Thomas Roy CLARKE

The Isaac and Leah Weinlos Prize
Donald Marvin CARR

The Surgical Research Prize
Robert Leighton FISK

The Associated Hospitals of Alberta Gold Medal and Prize
Phyllis Irene WICKIE

The H. E. Rawlinson Medical Book Awards
Gordon Ernest TRAUB
Elliot Thomas GELFAND

University of Alberta First Class Standing Prizes
Douglas Frederick WALLER
Morris Keith MILLER
Donald Marvin CARR

Third Year M.D.

Scholarships of the College of Physicians and Surgeons of the Province of Alberta
1st Roger William McClung AMY
2nd Donald Gordon RAWLINSON

Dr. Allan Coates Rankin Award
Regina ZUEGE

The Vessie Heckbert Memorial
Michael AKPATA

The Percy H. Sprague Prize in Medicine
Michael DAVIDMAN

The Prize of the Associated Hospitals of Alberta in Medicine
Michael DAVIDMAN

The John James Ower Memorial Scholarship
Michael DAVIDMAN

The Isaac and Leah Weinlos Prize
Barry Kent REMINGTON

The C. V. Mosby Book Awards
Regina ZUEGE
Paul RENTIERS
Peter CHUE
John CHORNELL
Henry SIMICHAK

The Prize of the Associated Hospitals of Alberta in Surgery
Donald Gordon RAWLINSON

University of Alberta First Class Standing Prizes
Roger William McClung AMY
Donald Gordon RAWLINSON

Second Year M.D.

Scholarships of the College of Physicians and Surgeons of the Province of Alberta
1st Robert Edward MILLER
2nd Angus Henderson KIRK

The Vessie Heckbert Memorial
Peter Paul PATTERSON

The Allan Coates Rankin Prize in Bacteriology
Jean Dorothy GILLIS

The Nathan Browne Eddy Prize in Pharmacology
Robert Edward MILLER

University of Alberta First Class Standing Prize
Robert Edward MILLER

First Year M.D.

Scholarships of the College of Physicians and Surgeons of the Province of Alberta
1st James Morrison WRIGHT
2nd David Lorne John TYRRELL

The Hugh and Mabel McAfee Memorial Scholarship
David Lorne John TYRRELL

The A. W. Downs Prize in Physiology
Lawrence Wayne MIX

University of Alberta First Class Standing Prizes
James Morrison WRIGHT
David Lorne John TYRRELL
Stuart Francis NICHOLSON

Program Leading to the Degree of Bachelor of Science in Medical Laboratory Science

The University of Alberta offers a degree course in Medical Laboratory Science to men or women who are interested in a career as laboratory supervisors or senior technologists in hospitals or medical science laboratories.

The course is four years in duration. The first, second and fourth years of the program are regular university years. The third year of the program, which begins in mid-May, includes a 12-month period of practical laboratory training under the supervision of the Faculty of Medicine.

Students will receive some remuneration from the hospital during the third year of the program.

Owing to limitation of facilities it is not possible to give consideration to the admission of students from other programs to the second or subsequent years of this course.

The coordinator of the program is Miss J. Matheson, of the Department of Pathology.

Note: Intending students should read also those earlier sections of this calendar dealing with requirements for admission, student advisory services, the dean of women, registration, fees, payment of fees, living accommodation,

students' union, student medical services, regulations of the university, examination results, appeals, withdrawal of students, supplemental examinations.

Immunization

Because individuals working in hospital laboratories run some risk of infection from materials which they will be handling, all students in the Medical Laboratory Science program must take a series of immunizations approved by the Office of the Dean of Medicine before they may commence the third year of the program.

Promotion

The pass mark in each subject is 50% but the general average each year of 60% is required for students in this program.

Examinations

Examinations will be held at the end of each academic year in all subjects given in that year and promotion to a subsequent year will depend upon satisfactory completion of the current year.

Hospital Practice

During the period of hospital practice in the third year of the program students will be registered full-time students at the university and will be assigned to hospital laboratories approved for this training by the Council of the Faculty of Medicine at the University of Alberta.

Graduation

After successful completion of the full four year course the student will be eligible to graduate in the Spring Convocation. However, in order to qualify he must have obtained an overall average of at least 60% in the courses of all four years of the program.

Outline of Courses—B.Sc. (M.L.S.) Program

First Year	Course No.	1st Term Lect.	1st Term Lab.	2nd Term Lect.	2nd Term Lab.
Inorganic Chemistry	Chem. 230	3	4	3	4
Organic Chemistry	Chem. 250	3	3	3	3
English	English 200 or 210	3	0	3	0
Biology	Biology 130 or 230	3	3	3	3
Elementary Physiology	Physiol. 261	3	3	3	3
Physical Education	P.E. 218 or 228	0	2	0	2

Second Year	Course No.	1st Term Lect.	1st Term Lab.	2nd Term Lect.	2nd Term Lab.
Bacteriology	Bact. 361	3	3	3	3
Clinical Pathology	Clin. Path. 361	3	6	3	6
Clinical Biochemistry	Biochem. 400	2	3	2	3
Physics	Physics 100 or 200	3	2	3	2
An approved Humanities or Social Science option		3	0	3	0

Third Year	Course No.	1st Term Lect.	1st Term Lab.	2nd Term Lect.	2nd Term Lab.
Biochemistry	Biochem. 300	3	3	3	3
Med. Lab. Science	M.L.S. 400	...	...	...	...

Fourth Year	Course No.	1st Term Lect.	1st Term Lab.	2nd Term Lect.	2nd Term Lab.
An approved Natural Science option		3	0	3	0
Analytical Chemistry	Chem. 312	3	6	3	6
Clinical Biochemistry	Biochem. 401	2	0	0	0
Med. Lab. Science	M.L.S. 401	3	6	3	6
An approved Humanities or Social Science Option		3	0	3	0

Interdepartmental Teaching

In the second and subsequent years of the program teaching in Clinical Pathology, Clinical Biochemistry, and Bacteriology is combined on an interdepartmental basis and examinations in these subjects may also be combined.

DETAILS OF COURSES

(B.Sc. (M.L.S.) Program)

Interdepartmental Courses

Path 400—R. E. Bell, H. E. Bell, D. J. Campbell and others

Medical Laboratory Science—Pathology 400 is a 12-month rotation in the following hospital departments—Bacteriology, Clinical Chemistry, and Hematology, blood banking and histology. Lectures, weekly conferences and twice-monthly seminars will be held to enlarge year and extend the practical training and to integrate work in all the areas covered. A comprehensive practical and theoretical examination will be held at the end of this training period. The pass mark in this course is 60%. Supplemental privileges are not allowed.

Path 401—H. E. Bell, D. J. Campbell, H. B. Collier and Staff (3-6; 3-6)

Medical Laboratory Science—This course will be comprised of lectures, seminars and laboratory exercises on the following:— laboratory planning, organization and administration; statistical evaluation of selected procedures; directed observation and instruction in the use of special equipment; etc.

Bacteriology

Bact 361—S. R. Tosach, Y. Goodman and Members of the Department (3-3; 3-3)

Pathogenic Bacteriology—The relation of bacteria, viruses, fungi and protozoa to disease. The isolation and identification of bacteria, pathogenic to man. A study of bacterial infections and of resistance and immunity. Some consideration will be given to comparative bacteriology.

Note: for 1966-67 this course is available only to students in the M.L.S. pattern. Other students who may have planned to take the course should seek admission to Bacteriology 421.

Biochemistry

Bioch 300—Members of Staff (3-3; 3-3)

General Course—Structure and chemistry of the cell; acidimetry and alkalimetry; chemistry of carbohydrates, lipids, proteins and nucleic acids; enzymes; bioenergetics; digestion, absorption and intermediary metabolism of carbohydrates, lipids, proteins, and nucleic acids; mineral metabolism; vitamins; blood chemistry; chemistry of respiration..

Prerequisites: Chemistry 230, Chemistry 250.

Bioch 400—H. B. Collier and D. J. Campbell (2-3; 2-3)

Clinical Biochemistry—Principles of instrumentation; quality control; clinical chemistry of blood and urine; gastric, kidney and liver function tests; disturbances of acid-base, electrolyte, and mineral metabolism. The emphasis throughout the course is upon critical appraisal of biochemical methods as applied to the study of disease.

Prerequisites: Chemistry 230, Chemistry 250.

Bioch 401—H. B. Collier (2-0; 2-0)

Biochemistry—An advanced course in principles and instrumentation; quality control; clinical chemistry of blood and urine; gastric, kidney and liver function tests; disturbances of acid-base, electrolyte and mineral metabolism; inborn errors of metabolism.

Prerequisite: Biochemistry 300 or 400.

Biology

Biol 130 (3-3; 3-3)

An introduction to Biology, with emphasis on principles. Not open to students with credit in Biology 30.

Biol 230 (3-3; 3-3)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This course is prerequisite to most senior biology courses.

Prerequisite: Biology 30 or Biology 130.

Chemistry

Chem 230 (3-1s-3; 3-1s-3)

Inorganic Chemistry—Lectures: The fundamental concepts of Chemistry as applied to the elements and their compounds.

Laboratory: The preparation of some compounds; quantitative chemistry.

Prerequisite: Chemistry 130 or Chemistry 30 (High School) or equivalent.

Chem 250 (3-1s*-3; 3-1s*-3)

Organic Chemistry—Lectures: An introduction to a study of the compounds of carbon.

Laboratory: The preparation of some organic compounds.

Textbook: Boyd and Morrison, *Organic Chemistry.*

Prerequisite: Chemistry 130 or Chemistry 30 (High School) or equivalent.

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*Students not concurrently taking Chemistry 230 are required to take the one hour seminar.

Chem 312 (3-6; 3-6)

Quantitative Analysis—Lectures: Principles and methods of quantitative analysis.

Laboratory: Basic analytical methods including volumetric, gravimetric, ion and gas chromatography, potentiometry, radiometric, colorimetric and simple spectrometric.

Prerequisite: Chemistry 230 or 232.

English

Engl 200 (3-0; 3-0)

A Survey of English Literature from Chaucer to the Twentieth Century—A close study of representative masterpieces. Essays and tests on the prescribed literature will be given to afford practice in setting down ideas in good English.

Engl 210 (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

Pathology

Path 361—H. E. Bell and J. Matheson (3-6; 3-6)

Clinical Pathology—A course in Clinical Pathology designed for students in the B.Sc.(M.L.S.) pattern. The lectures will be on the use and interpretation of laboratory methods as diagnostic aids. The laboratory periods will be designed to develop in the student a high degree of accuracy and reasonable speed in hematological and other clinical pathological procedures that are used in a modern hospital laboratory.

The teaching in this course in closely integrated with teaching in the other medical laboratory disciplines of biochemistry and microbiology. Because of the integration of the laboratory work in these subjects, registration is limited to students in the M.L.S. pattern.

Prerequisite: Physiology 261.

Physics

Phys 100 (3-3; 3-3)

Introductory General Physics—An introductory course on the basic principles of physics. Illustrated by experiments.

Phys 200 (3-3; 3-3)

General Physics—A general course in the fundamentals of physics, including mechanics, properties of matter, heat, sound, electricity and light. Illustrated by experiments.

Prerequisite: Physics 30 or 100.

Note: Physics 100 is a terminal course. It is the only choice available to students lacking credit in Grade XII physics, and does not fulfil prerequisite requirements for any senior physics courses. Physics 200 may be taken following Grade XII physics; it is accepted as a prerequisite for certain courses on advanced topics in physics.

Physiology

Physl 261—Staff (3-3; 3-3)

Elementary Human Physiology—A lecture and laboratory course for students of Medical Laboratory Science and the School of Rehabilitation Medicine. The Lecture Course is oriented towards human physiology.

XVII

The School of Nursing

INFORMATION, REGULATIONS, COURSES

(1) INTRODUCTION

On September 28, 1923, the Board of the University of Alberta Hospital recommended to the Senate of the University of Alberta that a School of Nursing be constituted. In that year the new school was established under the Faculty of Medicine and offered two programs: a five-year program leading to the degree, Bachelor of Science in Nursing, and a three-year program leading to the Diploma in Nursing.

Until 1936 students completed the final year of the degree program at the Universities of British Columbia, Toronto or McGill. In 1937 Public Health Nursing was offered on this campus as one of the options in the final year. In 1946 a second option, Teaching and Supervision in Schools of Nursing, was made available.

A number of revisions have been made in the degree program. From 1923 through 1936 the students spent the first two academic years at university, the third and fourth at the hospital and the fifth year at university. There was a preliminary term of three months at the hospital at the close of the first academic session. The total time required in hospital was thirty months.

Students registering for the degree program in 1937 spent one academic year at university, thirty-one months in hospital and a final year at university.

From 1938 through 1951 the student spent one academic year at university, thirty-six months in hospital and a final year at university.

In 1951 the first year of the degree program was offered at the Calgary Branch of the University, as well as in Edmonton.

In September, 1952, the degree program was shortened to a four-year integrated course.

In September, 1952, a two-year program leading to the degree, Bachelor of Science in Nursing, was made available to registered nurses.

In May, 1954, at the request of the University of Alberta Hospital Board, the School of Nursing at the University of Alberta Hospital was placed under the jurisdiction of the Hospital Board and ceased to function under the Faculty of Medicine, University of Alberta.

In September, 1954, the degree course was changed to a five-year program. Through affiliation agreements, students could take the clinical portion of the curriculum at either the School of Nursing, Calgary General Hospital, Calgary, or at the School of Nursing, University of Alberta Hospital, Edmonton. The affiliation with the Calgary General Hospital was suspended from September 1960. Students spent the three clinical years, second, third and fourth at the University of Alberta Hospital School of Nursing.

In September, 1966, a new four-year integrated degree program will be implemented, the entire four years, theory and practice, to be under the direction of the University of Alberta teaching staff.

Over the years a number of programs have been made available to graduate nurses. A one-year program leading to the Diploma in Public Health Nursing was instituted in 1937. The five months' course leading to the Certificate in Advanced Practical Obstetrics was organized in 1943 and a one year program leading to the Diploma in Teaching and Supervision in Schools of Nursing was instituted in 1946.

Philosophy and Objectives of the School of Nursing

Philosophy

We believe that it is the responsibility of the University of Alberta School of Nursing to provide the kinds of learning experiences that will assist selected candidates in developing competence in nursing and in developing the ability to assume positions of responsibility and leadership in meeting the nursing needs of our changing society.

Objectives

To assist the student in developing the ability to make sound judgments based on critical thinking.

To assist the student in developing the nursing skills of total patient care based on the understanding of the biological, physical, and social sciences and to apply these skills and knowledge to a special field of interest.

To assist the student in realizing an increasing degree of emotional, social and professional maturity.

Student Life and Welfare

Students registered in the basic degree program and post-graduate students make arrangements for their own living accommodation. The women's residence on the Edmonton campus is available to a limited number. Application for reservations, accompanied by $30.00, should be forwarded to the Director of Housing, University of Alberta, in the early spring.

The University medical services are available to students throughout the program.

Recreational facilities on the campus are available to all students.

Through a guidance program the staff seeks to assist students who have social, emotional and personal problems.

Professional counselling and guidance are available at the Student Counselling Service. The office of the Director is in the Education Building, Edmonton. There is a Counselling Service in Calgary.

All students on admission are given aptitude and achievement tests.

Programs Offered by the School of Nursing

The University of Alberta School of Nursing offers the following basic and post-basic professional programs:

Undergraduate Program

A four-year integrated program leading to the degree, Bachelor of Science in Nursing.

Graduate Nurse Programs

A two-year program leading to the degree, Bachelor of Science in Nursing.
A one-year program leading to the Diploma in Public Health Nursing.
A one-year program leading to the Diploma in Teaching and Supervision in Schools of Nursing
A 5-month program leading to the Certificate in Advanced Practical Obstetrics.

Description of Programs

Basic Program Leading to the Degree of B.Sc. in Nursing

The program of study is planned to utilize the scientific and liberal arts courses of the University as a background on which to build professional competence.

NOTE: Until 1970, when the last class of the five-year degree program will graduate, enrollment in the basic degree program will be limited to 20-25 students.

Post-Basic Program Leading to the Degree of B.Sc. in Nursing

This program offers registered nurses the opportunity to qualify for the degree, B.Sc. in Nursing.

The program of study includes courses in the biological, physical, and social sciences, general education and nursing, qualifying the nurse for positions in Schools of Nursing and Public Health Agencies.

Courses required for the first year of this program are offered at the universities in Edmonton and Calgary and at some Junior Colleges in the province.

Program Leading to the Diploma in Public Health Nursing

The course is designed for registered nurses who wish to prepare themselves to function as staff nurses in official and voluntary public health agencies.

Program Leading to the Diploma in Teaching and Supervision in Schools of Nursing

The program is designed for registered nurses who wish to prepare themselves to function more effectively in administrative, supervisory and teaching activities.

Program Leading to the Certificate in Advanced Practical Obstetrics

The course provides a program of instruction and supervised clinical experiences for nurses who are interested in preparing for positions of responsibility in the field of obstetrical nursing.

General Fees

Applicable to the Degree Course and Diploma in Public Health or in Teaching and Supervision:

Students' Union:*	
General	$12.50
Building Fund	15.00
University Athletic Board	7.00
	$34.50

*Full particulars on these fees may be found in the Students' Union Handbook.

Applicable to the Second, Third and Fourth Years of the old five-year program:

Registration	$10.00
Students' Union	4.50
	$14.50

(2) ADMISSION REQUIREMENTS

A.—Basic Program Leading to the Degree of B.Sc. in Nursing

Students from Alberta high schools seeking admission to the University will be required to present:

(a) a High School Graduation Diploma with

(b) "B" or higher standing in the following Grade XII examination subjects:

1. English 30
2. Social Studies 30
3. Chemistry 30
*4. Biology 30
5. & 6. Two of:
Mathematics 30; French 30, or German 30 or Latin 30 or Ukrainian 30 or another language at an equivalent level; Physics 30;

(c) an average in these six courses of at least 60%

NOTE: Students who completed Grade XII in 1954 or earlier will be given full consideration for admission. They are advised to write to the Registrar of the University and to provide a complete transcript of their high school records.

*Students who completed Grade XII in 1965 or earlier may present Biology 32 in place of Biology 30.

These general regulations notwithstanding, the University may in its discretion refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements at the University of Alberta.

B.—Post-Basic Program Leading to the Degree of B.Sc. in Nursing

Applicants must be registered nurses and present evidence of professional competence and the ability to carry and profit from postgraduate study. Students will normally be required to complete at least the year of specialization as full-time intramural students of the School of Nursing, University of Alberta. Further requirements are:

1. Academic requirement outlined in "A" above.
2. Satisfactory clinical experience, including psychiatric nursing. Applicants must submit a transcript from their Hospital School of Nursing. Deficiencies in clinical experience will have to be made up and arrangements relative to length and type of experience are subject to the approval of the University.

C.—Program Leading to the Diploma in Public Health Nursing

D.—Program Leading to the Diploma in Teaching and Supervision in Schools of Nursing

Academic requirements as outlined in A

Note: Under exceptional circumstances, consideration may be granted on an individual basis and in consultation with the Student Counselling Services.

E.—Program Leading to the Certificate in Advanced Practical Obstetrics

Registered nurses with experience in obstetrical nursing will be considered on an individual basis.

Procedure for Admission to Undergraduate Program:

Basic Program Leading to B.Sc. in Nursing

1. Obtain application forms from the Registrar, University of Alberta.
2. Application forms and medical report form should be completed as outlined under Admission Procedures in Part I of this calendar.

Procedure for Admission to Graduate Nurse Programs:

Post Basic Program Leading to the Degree of B.Sc. in Nursing

Program Leading to the Diploma in Public Health Nursing

Program Leading to the Diploma in Teaching and Supervision in Schools of Nursing

Program Leading to the Certificate in Advanced Practical Obstetrics

1. Obtain application forms from the Registrar, University of Alberta.
2. The completed forms should be returned to the Registrar. This includes:
   (a) The University Application for Admission.
   (b) The Graduate Nurse Information Form.
   (c) Two Official High School Transcripts.
   (d) Transcript of School of Nursing Record.

(3) Promotion and Graduation

In addition to the information given below, students should read carefully the regulations concerning attendance, examinations, and promotions, found in Part I of this calendar, as these also are applicable to students in the School of Nursing.

For promotion from first to second year, students are required to pass all courses with a grade point of at least 4 and a grade point average of 4.5. Details of the grade point averages required for promotion and graduation will be announced at the beginning of the term.

In the post-basic degree program (final year) and the diploma programs, an average of 65% or its equivalent grade point average is required for graduation.

Students who have unexcused absences totalling one-eighth or more of the total number of lectures in each course may be refused permission to write the final examination.

Field experience must be completed before a student will be recommended to General Faculty Council for the degree, diploma, or certificate for which the student is a candidate.

No student registered in the post-basic program may proceed to the work of the next year without having completed satisfactorily the clinical experience as outlined in the calendar.

(4) PROGRAMS OF STUDY

NOTE: Except in Advanced Practical Obstetrics, the weekly hours of instruction for various courses are set out for both terms of the winter session. The letter "c" attached to a figure signifies clinic-hours, and the letter "s" seminar-hours. Otherwise, the first figure in each term indicates lecture-hours and the second laboratory hours.

A.—Basic Program Leading to the Degree of Bachelor of Science in Nursing

First Year

Sept.-April	English 200 or 210
	Sociology 202
	Psychology 202
	Physiology 260
	Microbiology 231
	Physical Education 228
	Nursing 210
	Nursing 231
May	Nursing 241

Second Year

Sept. (3 wks.)	Nursing 331
Sept.-April	Chemistry 250
	Approved Psychology
	Approved Sociology
	Nursing 341
	Nursing 351
May-Aug.	Nursing 352 (3 months)
	Vacation (1 month)

Third Year

Sept.-April	Approved Senior option
	Bacteriology 441
	Nursing 361
	Nursing 371
	P.H. 409
	N.Ed. 459
May-Aug.	Nursing 372 (3 months)
	Vacation (1 month)

Fourth Year

Sept.-April	N.Ed. 450
	N.Ed. 451
	Approved Senior option
	Approved Senior Psychology or Sociology
	Psychology 309 or Statistics 305
	And *one* of
	P.H. 400
	N.Ed. 454
	N.Ed. 456
May	Nursing 460

Arrangements are being made for the payment of an honorarium during the two three-month Summer periods (second and third years).

B.—Post-Basic Program Leading to the Degree of Bachelor of Science in Nursing

First Year

English 200 or 210
Psychology 202, 212 or Ed. Psych. 276
Chemistry 250
Biology 130 or 230
Sociology 202

Second Year

Bacteriology 441
P.H. 401
N.Ed. 450
N.Ed. 451
Senior Psychology (1 term)
Senior Psychology or Sociology (2 terms)
Senior Option

Plus required courses in one of the following areas:

Teaching and Supervision	Public Health Nursing
N.Ed. 454	P.H. 400
N.Ed. 456	P.H. 402
P.H. 409	P.H. 406
	N.Ed. 459

Because of the heavy course load in the final year, it is recommended that one academic course be taken at a Summer Session.

C.—Programs Leading to the Diploma in Teaching and Supervision in Schools of Nursing or in Public Health Nursing

Bacteriology 441
P.H. 401
N.Ed. 450
N.Ed. 451
Psychology 212 or 202 or Ed. Psych. 276

Sociology 202
Teaching and Supervision — Public Health Nursing
N.Ed. 454 — P.H. 400
N.Ed. 456 — P.H. 402
P.H. 406

Field Experience

Concurrent field experience is included in a number of courses of study. Students spend one-half day per week during the first term and one day per week during the second term observing and teaching in local health and social agencies.

Four weeks of full time field experience in selected health agencies follows final examinations.

E.—Program Leading to the Certificate in Advanced Practical Obstetrics

1. Subjects:		Hrs. per wk. (10 weeks)
Principles of Obstetrics and Mechanisms of Labour	A.O. 35	6- 0
The Care of the Obstetrical Patient	A.O. 35A	3-12c
Infant Care	A.O. 35B	1- 0
Principles of Teaching and Supervision in Obstetrical Nursing	A.O. 35C	2- 0

2. Clinical Experience:

1. (a) Concurrent supervised experience in the antepartum, intrapartum and postpartum care of patients and in the care of the normal infant. Twelve hours each week.
   (b) Supervised experience in the premature nursery—five days. (Thirty-five hours).
2. Seven weeks observation and supervised clinical experience in selected obstetrical units throughout the Province. Each student must deliver, under medical supervision, a minimum of twenty cases during Part II of the course.
3. On satisfactory completion of the clinical experience the student returns for two weeks to the University where the course is summarized, case reports reviewed, and a written and oral examination conducted. This constitutes part three of the course.

3. FEES

Instruction Fees	$150.00
Registration	5.00
Medical Services	6.00
	$161.00

(5) DETAILS OF COURSES

The University School of Nursing reserves the right to withdraw any of the courses here outlined.

Students are reminded that attendance is expected in all courses.

TEACHING STAFF—

Associate Professors—Ruth E. McClure (Director of the School), Margaret M. Campbell

Assistant Professors—Salomea Tretiak, Shirley Stinson, M. Geneva Purcell, Joanne D. Zelech

Lecturers—Peggy Anne Field, Betty Harrington, Grace Tannahill

and—

Members of the Departments of Anatomy, Bacteriology, Botany, Chemistry, Dentistry, English, Household Economics, Medicine, Obstetrics and Gynaecology, Oto-Laryngology, Paediatrics, Pathology, Pharmacy, Psychology, Physical Education, Preventive Medicine, Psychiatry, Radiology, Rehabilitation Medicine, Sociology and Anthropology, Surgery, and Zoology.

I. COURSES IN NURSING

NURSING

Nursing 210. Human Anatomy (2-2)(0-0)

A systematic study of the structural basis of the body.

Nursing 231. Fundamentals of Nursing I (2-2)(2-3)

Lectures, conferences and hospital experience structured to promote the development of basic nursing skills and interpersonal relations.

Nursing 241. Fundamentals of Nursing II

(1 month—May) (10-20c)

Planned experience in the continuous and comprehensive care of patients with chronic or long term illness with the emphasis on rehabilitation nursing. Concurrent experience in Hospitals or Nursing Homes.

Nursing 331. Introduction to Medical-Surgical Nursing I

(3 weeks—September) (10-20c)

Lectures, demonstrations of nursing methods or processes as applied in meeting the basic nursing problems of patients undergoing or recovering following active treatment in a general hospital.

Nursing 341. Medical-Surgical Nursing II

(one term, 2nd year) (6-20c)

Content and emphasis derived from major causes of illness. The clinical experience is designed to extend and modify basic nursing skills to the care of patients whose acute or chronic illness is treated medically or subject to surgical intervention. Prevention, rehabilitation comprise a principal focus for seminars.

Nursing 351. Introduction to Maternal and Child Health I

(1 term, 2nd year) (6-20c)

The care of the patient during pregnancy, labour and postpartum period; care of the newborn; child development and effects of illness on normal development. Planned clinical experience will be provided in the departments of obstetrics, paediatrics, out-patients and child health centres.

Nursing 352. Maternal and Child Health II

(3 months summer 2nd year) (10-30c)

Complications of the maternal cycle and diseases common to specific age

groups in children will be studied in relation to nursing care. Supervised clinical experinence in departments of obstetrics and paedatrics.

Nursing 361. Psychiatric Nursing
(1 term, 3rd year) (3-20c)
Nursing of the mentally ill based on the knowledge of behavior as adaptive to human needs, and the multicausal influence in the development of personality disorders. Emphasis is on the therapeutic nature of communication (expressive role), in doctor-patient-nurse interpersonal relationship.

Nursing 371. Medical-Surgical Nursing III
(1 term, 3rd year) (3-20c)
Lectures, concurrent experience and conferences planned to promote a deeper understanding of nurse-patient interactions. Advanced Medical-Surgical Nursing techniques with experience in administration, public health and teaching specialties with the opportunity to assess, plan and direct care based on knowledge of the features of quality care throughout the various stages of illness.

Nursing 372. Nursing IV
(3 month, summer, 3rd year) (10-30c)
Practical experience of one month in each of the following areas:
Psychiatric Nursing—
The application of current principles of psychiatric care.
Surgical Nursing—
Experience in providing intensive care for the acutely ill and totally dependent patient—operatively and post-operatively.
Medical Nursing—
The management of patient care on an individual and group basis.

Nursing 460. Field Experience
(1 month, May, 4th year)
Observation and supervised experience in Public Health Nursing, Nursing Service or Nursing Education. This is arranged to meet the individual needs of the students.

NURSING EDUCATION

N.Ed. 450. Principles of Teaching Nursing and Health (3-1; 0-2)
R. E. McClure
Principles underlying the teaching-learning process; methods of directing learning, organization of materials of instruction. Practice in public speaking and supervised teaching included.

N.Ed. 451. Current Trends in Nursing—S. Stinson (0-0; 2-0)
A study and analysis of the progress and trends in nursing as influenced by forces within and outside the profession. Included is an introduction to statistics.

N.Ed. 454. Hospital Nursing Service Administration—S. Stinson (3-0; 3-2s)
The application of the basic principles of administration to Hospital Nursing Service with particular emphasis on effective Nursing Unit Management.

N.Ed. 456. The School of Nursing—S. Tretiak (3-0; 3-2c)
Foundations of nursing education. Principles of methods of curriculum development.

N.Ed. 459. Introduction to Hospital Nursing Service Administration—S. Stinson (2-0; 0-0)
An introduction to the basic principles of administration with particular application to Hospital Nursing Service Administration, emphasizing the relationship between administrative practices and improved patient care.

PUBLIC HEALTH

P.H. 400. Public Health Nursing—M. Campbell (3-0; 3-2S)
Trends and developments in preventive medicine; the organization and administration of public health services; the role of the nurse in public health services; the fundamental principles of public health nursing. Observation and practice in selected community health agencies.

P.H. 401. Community Health and Welfare—B. Harrington (2-2; 0-0)
Changing emphases in health programs including introduction to the principles of social welfare. Visits to community agencies.

P.H. 402. Epidemiology—M. Campbell (2-0; 1-0)
A study of the factors contributing to states of health and disease; methods of control and prevention of disease in the community.

P.H. 406. Maternal and Child Health—Dr. M. Hutton, B. Harrington (2-0; 2-2)
A study of modern concepts of maternal and child care with emphasis on the nurses' role in promoting sound physical and emotional health for the mother and child.

P.H. 409. Introduction to Public Health Nursing—B. Harrington (2-0; 0-0)
Principles of Public Health Nursing; the role of the nurse in Public Health services with emphasis on co-operation between Public Health and hospital services in the community.

ADVANCED OBSTETRICAL NURSING

A.O. 35. Principles of Obstetrics and Mechanisms of Labour (6-0)
Dr. J. Ross Vant, Dr. W. D. Frew, and other lecturers
The physiology and management of normal and abnormal pregnancy; theory and management of labour and delivery; principles underlying the administration of anaesthesia and analgesia; gynaecological conditions; the menopause.

A.O. 35A. The Care of the Obstetrical Patient (3-12c)
P. A. Field and other lecturers
Lectures, tutorials and concurrent field experience in ante, intra and post-partum care.

A.O. 35B. Infant Care—Dr. J. K. Martin and Paediatric staff (1-0)
The care of the normal and premature infant during the neonatal period.

A.O. 35C. Principles of Teaching and Supervision in Obstetrical Nursing (2-1c)
P. A. Field

The principles of teaching and supervision; their application in nursing service and nursing education. Practice in public speaking and supervised teaching will be included.

II. COURSES OFFERED BY OTHER DEPARTMENTS

BACTERIOLOGY

Bact 441.—A. M. Bursewicz (2-2; 0-0)

Bacteriology—The relation of bacteria to individual and community health. A study of infection and resistance in man and of methods of diagnosis and control of infectious disease.

BIOLOGY

Biol 130. (3-3; 3-3)

An introduction to Biology, with emphasis on principles. Not open to students with credit in Biology 30.

Biol 230. (3-3; 3-3)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This course is prerequisite to most senior biology courses.

Prerequisite: Biology 30 or Biology 130.

CHEMISTRY

Chem 250. (3-1S*-3)(3-1S*-3)

Organic Chemistry—An introduction to a study of the compounds of carbon.

Textbook: Boyd and Morrison, *Organic Chemistry.*

Laboratory: The preparation of some organic compounds.

Prerequisite: Chemistry 130 or 30 of High School or equivalent.

*Students not concurrently taking Chemistry 230 are required to take the one hour seminar.

EDUCATIONAL PSYCHOLOGY

Ed.Psy. 276. (3-0; 3-0)

Introduction to Educational Psychology—An introduction to childhood and adolescence, stressing physical, mental, social, emotional, and personality development; the psychology of learning and of the special learning areas: the application of psychological principles to classroom practice.

ENGLISH

Engl 200. (3-0; 3-0)

A Survey of English Literature from Chaucer to the Twentieth Century—A close study of representative masterpieces. Essays and tests on the prescribed literature will be given to afford practice in setting down ideas in good English.

Engl 210. (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

PHYSICAL EDUCATION

All first-year students are required to take two hours of physical education per week. Those excepted from this regulation are:

1. those declared unfit by the University Medical Services;
2. students over 25 years of age.

Students in these categories must register with the Faculty of Physical Education.

Individual lockers, locks, towels and shower facilities are available for all students. The program is conducted in the Physical Education Building.

The prescribed gymnasium costume is:

Shorts (dark green)
Sports blouse (white)
Socks (white)
Running shoes

Shorts may be purchased at the University Bookstore.

All first-year students are required to register in Physical Education.

P.E. 228—Physical Education Staff (0-2; 0-2)

Recreational Activities (Women)—Emphasis on the fundamentals of the following recreational and fitness activities: aquatics, movement fundamentals, tennis, badminton, dance and golf.

PHYSIOLOGY

Physiol 260. (3-1; 3-1)

Introductory Human Physiology—A lecture and laboratory demonstration course for Baccalaureate students in Nursing and for students in Physical Education. The course is oriented towards human physiology and the laboratory demonstrations are designed to illustrate important aspects of human physiology using modern techniques.

PSYCHOLOGY

Psyco 202. (3-0; 3-0)

Introduction to General Psychology—A survey of problems, methods and principles in various fields of psychology.

Psyco 212. (3-0; 3-0)

General and Developmental Psychology—A survey of problems, methods and principles in various fields of psychology, with particular emphasis on child, adolescent and adult development and behavior.

Psyco 353. (3-0; 0-0)

Developmental Psychology—A study of behavior as it is related to normal development and aging.

For descriptions of senior courses in psychology see the Calendar of the Faculties of Arts and Science.

SOCIOLOGY

Soc 202.—Staff (3-0; 3-0)

Introductory Sociology—An introductory analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society is analysed in terms of its structure, culture and social ranking schemes. The interrelationships between the various

institutions (e.g. family, church, school, government) are considered. The processes are examined whereby the individual is socialized into society, as are the sources of conformist and non-conformists behavior.

For senior courses in Sociology refer to the Calendar of the Faculties of Arts and Science.

NOTE: Third year or more advanced students are encouraged to take 402 rather than 202.

XVIII

The Faculty of Pharmacy

INFORMATION, REGULATIONS, COURSES

FACULTY OF PHARMACY

(1) OPPORTUNITIES IN PHARMACY

With the rapid advancement being made in medical science during the present century, pharmacy is becoming a more and more specialized profession. The responsibilities associated with the distribution of drugs and pharmaceutical preparations are constantly increasing as new therapeutic agents are developed. In addition, the importance in the community of the pharmacist as a counsellor on public health matters and as a source of scientific information of a general character is becoming better appreciated by the general public. Educational standards have been advanced to meet these increasing demands and ample scope is provided to the young man or woman who wishes to enter pharmacy as a career.

There is always a demand for well-trained pharmacists and never before have opportunities been so great in pharmacy and its many allied fields. The following are some of the avenues open to qualified pharmacists: as proprietors, managers, and prescription clerks in retail stores; as dispensers in hospital pharmacies; as pharmaceutical and research chemists in manufacturing plants; as manufacturers' or wholesalers' representatives.

Retail Pharmacy

Retail pharmacy continues to attract the highest proportion of graduates. Since pharmacy is both a profession and a business this unique combination offers a satisfying and rewarding opportunity for service. The expanding economy of the country, and of Alberta in particular, will continue to provide conditions favorable to success.

Hospital Pharmacy

The contribution which the pharmacist can make in the hospital is being more fully realized and his skills more adequately utilized. His duties include the dispensing of prescriptions, control of drugs and other stores and supplies, manufacture of drugs, preparations, parenteral solutions, etc., the compiling and organization of data on recent advances in pharmacy so as to act as an adviser to nurses and doctors on new developments.

Public Health Laboratories

Graduates in pharmacy are well qualified to fill positions in municipal, provincial and federal health laboratories.

Manufacturing Pharmacy

There are many openings in manufacturing firms for pharmacy graduates as pharmaceutical and research chemists. This is particularly true for those graduates who supplement their basic pharmaceutical education with advanced or specialized training. Many graduates, also, find interesting and useful posi-

tions as manufacturers' representatives. Association with such firms opens up the possibility of advancement to executive positions.

Research

Upon completion of his undergraduate work the capable student finds many possible avenues open to him for graduate work leading to advanced degrees. Such special training equips the student for gratifying positions in research and teaching.

Women in Pharmacy

There are many opportunities for women in pharmacy. They find a natural place in hospitals, medical clinics, and in the larger dispensaries. Also, an increasing number of women are entering the field of retail pharmacy and research.

(2) QUALIFICATIONS FOR PRACTICE IN ALBERTA

The Bachelor of Science degree in Pharmacy of the University of Alberta is the minimum academic requirement accepted by the Alberta Pharmaceutical Association for the licence to practise pharmacy in the province of Alberta.

Candidates for the course in pharmacy were formerly required to complete twelve months of practical experience before entering the University. This requirement has been withdrawn. In order to register as a pharmacist with the Alberta Pharmaceutical Association a graduate must have completed 12 months of practical experience but this need not be served before university entrance. Information concerning the regulations applying to practical experience in Alberta may be obtained from the Registrar-Treasurer, Alberta Pharmaceutical Association, College of Physicians and Surgeons Building, 9901-108 Street, Edmonton, Alberta.

The regulations governing the practice of Pharmacy in the Province of Alberta are set forth in the Alberta Pharmaceutical Association Act.

(3) ENTRANCE REQUIREMENTS

Students from the high schools of Alberta seeking admission to the Faculty of Pharmacy will be required to present:

(a) a high school diploma with

(b) "B" or higher standing in Grade XII Departmental examinations in English 30; Social Studies 30; Mathematics 30; Chemistry 30; and any two of: Physics 30, Biology 30 (or 32), French 30 or German 30 or Latin 30, or Ukrainian 30, or another language at an equivalent level. (Physics and Biology 30 are recommended as the most practical options. Biology 32 will not be accepted if taken after September 1965.)

(c) an average in these courses of at least 60%.

Applications to enter the Faculty of Pharmacy should be submitted to the Registrar, University of Alberta, on or before the August date shown in the Academic Schedule.

Enrolment in any faculty must necessarily be limited to the number of students who can be accommodated. Students are normally accepted in the

order of their academic standing from among the whole list of applicants. Students therefore, should not come to the University until they have received an official acceptance of their application.

These general regulations notwithstanding, the University may in its discretion refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements at the University of Alberta.

(4) PASS REQUIREMENTS

The pass mark in all lecture courses is 50%; the pass mark in laboratory courses in pharmacy subjects is 60%. In the case of failure in a pharmacy laboratory course there is no supplemental privilege and the laboratory course, together with the corresponding lecture course, must be repeated. When a grade-point system is introduced designations comparable to the percentages required will be applied.

(5) PROGRAMS OF STUDY

The course in pharmacy is four years in length. The previously offered three year course has been discontinued. In the fourth year the student chooses an area of specialization in Pharmacy Administration, or Hospital Pharmacy or Pharmaceutical Science. The first three years of the curriculum are common to all patterns.

Students wishing to take a first year at another campus should select the non-pharmacy courses of first year and add physics from the second year. Transferees will be admitted to second year pharmacy to the extent that space and facilities permit.

Honors Program—Students with a 65% or better average over the second and third years will be eligible to take the fourth year as an Honors Program. Those obtaining a 65% or better average mark over the second, third and fourth years will be awarded the degree of Bachelor of Science in Pharmacy with Honors in Pharmacy Administration, or Hospital Pharmacy, or Pharmaceutical Science. Those obtaining an 80% or better average will be awarded the degree with First Class Honors.

Degree with Major—Students with satisfactory records but with less than a 65% average over the second and third years will be eligible to take the fourth year as a Major Program. Successful candidates will be awarded the degree of Bachelor of Science in Pharmacy with Major in Pharmacy Administration, or Hospital Pharmacy or Pharmaceutical Science.

Honors candidates who pass all courses but do not obtain honors standing will be granted a degree with a Major in the specialty.

All programs of study must be worked out in consultation with members of the faculty and approved by the Dean. It is desirable that students decide after the first year the area of later specialization so that options in the second and third years may provide a foundation for the chosen specialty. For example, a student planning to enter the Pharmacy Administration program would be advised to select courses in economics and commerce; students planning to enter Hospital Pharmacy might select courses in biochemistry and microbiology;

students planning to enter the Pharmaceutical Science pattern might select mathematics, statistics or chemistry.

Note: The lecture courses in pharmacy are designated by even numbers. The corresponding laboratory course is indicated by the odd number immediately following the lecture number.

First Year

Subjects	Course No.	First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Biology*	Biol. 130 or 230	3	3	3	3
Chemistry	Chem. 230	4	3	4	3
Organic Chemistry	Chem. 250	3	3	3	3
Introductory Pharmacy	Pharm. 210	3	...	3	...
Introductory Pharmacy Lab.	Pharm. 211	...	3	...	3
English	Eng. 210	3	...	3	...
Physical Education	Phys. Ed.	...	2	...	2

*Students with Biology 30 take Biology 230. Others take Biology 130.

Second Year

Subjects	Course No.	First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Dispensing Pharmacy	Pharm. 322	3	...	3	...
Dispensing Pharmacy Laboratory	Pharm. 323	...	3	...	3
Pharmacognosy	Pharm. 324	2	...	...	...
Pharmacognosy Laboratory	Pharm. 325	...	3	...	...
Introduction to Medicinal Chem.	Pharm. 326	...	...	2	...
Qual. Anal. of Organ. Medicinals	Pharm. 327	...	...	...	3
Bacteriology	Bact. 320	3	3	3	3
Physiology	Physiol. 361	3	3	3	3
Physics*	Physics 100 or 200	3	3	3	3
Option**		3	...	3	...

*Students with Grade XII Physics take Physics 200. Others take Physics 100.

**An approved course in the Humanities or Social Sciences.

Third Year

Subjects	Course No.	First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Biochemistry	Biochem. 300	3	3	3	3
Pharmacology	Pharmacol. 431	2	3	2	3
Pharmaceutical Analysis	Pharm. 430	2	...	2	...
Pharmaceutical Analysis Lab.	Pharm. 431	...	3	...	3
Pharmaceutics	Pharm. 432	2	...	2	...
Pharmaceutics Lab.	Pharm. 433	...	3	...	3
Forensic Pharmacy	Pharm. 434	2	...	...	...
Medicinal Chemistry	Pharm. 436	3	...	3	...
Option*		3	(3)	3	(3)

*An approved Arts or Science course.

Fourth Year

Pharmacy Administration—

Subjects	Course No.	First Term		Second Term	
		Lect.	Lab.	Lect.	Lab.
Pharmaceutical Therapeutics	Pharm. 444	3	0	3	0
Pharmacy Management	Pharm. 448	2	0	2	0
Thesis	Pharm. 449	1S	3	1S	3
Accounting	Acct. 200	3	2	3	2
Veterinary Science	Vet. Sci. 404	1	0	1	0
Three approved options from the following areas:—economics, commerce, senior pharmacy or other science.					

Hospital Pharmacy—

Advanced Pharmaceutics	Pharm. 442	1	0	1	0
Advanced Pharmaceutics Lab.	Pharm. 443	0	3	0	3
Pharmaceutical Therapeutics	Pharm. 444	3	0	3	0
Hospital Pharmacy	Pharm. 446	1	0	1	0
Hospital Pharmacy Laboratory	Pharm. 447	0	4	0	4
Thesis	Pharm. 449	1S	3	1S	3
Two approved courses in pharmacy, other science or business.					

Pharmaceutical Science—

Advanced Pharm. Anal.	Pharm. 440	3	0	3	0
Advanced Pharm. Anal. Lab.	Pharm. 441	0	3	0	3
Thesis	Pharm. 449	1S	3	1S	3
Three approved options in:—mathematics, statistics, chemistry, biochemistry, physiology, pharmacy, or other science.					

(6) GRADUATE STUDY

Students may undertake graduate study in pharmacy leading to the degree of M.Sc. or Ph.D. Any students contemplating such work should discuss their programs with the Dean of the Faculty of Pharmacy. They should also familiarize themselves with the regulations and procedures laid down by the Faculty of Graduate Studies. These may be found in the calendar of the Faculty of Graduate Studies. A few of the more important regulations are summarized below:

1. Students planning to begin graduate work should make application, not later than the date set in the Academic Schedule, for admission to the Faculty of Graduate Studies. Applications should be addressed to the Dean, Faculty of Graduate Studies.
2. Students planning to continue graduate study are reminded that, in addition to completing regular registration forms, they must submit to the Faculty of Graduate Studies a new program form showing the courses to be taken immediately and noting any changes in the original program of studies.

3. Students must register and pay the usual registration and other fees for the session in which they submit their theses.

(7) DETAILS OF COURSES

(Regular attendance is expected of all students in the Faculty of Pharmacy.)

NOTE: The weekly hours of instruction for both terms of the winter session are shown at the top of each course description. The first figure in each term indicates lecture-hours and the second laboratory-hours.

BIOCHEMISTRY

Bioch 300—Members of Staff (3-3; 3-3)

General Course—Structure and chemistry of the cell; acidimetry and alkalimetry; chemistry of carbohydrates, lipids, proteins and nucleic acids; enzymes; bioenergetics; digestion, absorption and intermediary metabolism of carbohydrates, lipids, proteins, and nucleic acids; mineral metabolism; vitamins; blood chemistry; chemistry of respiration.

Prerequisites: Chemistry 230, Chemistry 250.

BIOLOGY

Biol 130 (3-3; 3-3)

An introduction to Biology, with emphasis on principles. Not open to students with credit in Biology 30.

Biol 230 (3-3; 3-3)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This course is prerequisite to most senior biology courses.

Prerequisite: Biology 30 or Biology 130.

CHEMISTRY

Chem 230 (3-1S-3)(3-1S-3)

Inorganic Chemistry—Lecture: The fundamental concepts of chemistry as applied to the elements and their compounds.

Laboratory: The preparation of compounds, quantitative chemistry

Prerequisite: Chemistry 130 or 30 of High School or equivalent.

Chem 250 (3-1S*-3; 3-1S*-3)

Organic Chemistry—Lectures: An introduction to a study of the compounds of carbon.

Laboratory: The preparation of some organic compounds.

Textbook: Boyd and Morrison, *Organic Chemistry.*

Prerequisite: Chemistry 130 or 30 of High School or equivalent.

Chem 450 (3-3; 3-3)

Organic Chemistry—Lectures: Continuation of the study of the aromatic and aliphatic compounds. General considerations and mechanisms involved in their reactions.

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*Students not concurrently taking Chemistry 230 are required to take the one hour seminar.

Laboratory: Preparation of some organic compounds.
Prerequisites: Chem. 230 and 250 or 350.
Prerequisites or corequisites: Chem. 370 or 372.

ENGLISH

Engl 210 (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

MICROBIOLOGY

Micrb 320—G. E. Myers (3-3; 3-3)

Pharmaceutical Microbiology—An introduction to microbial classification, metabolism and behaviour with emphasis on the practical application of this knowledge in human and animal disease. Special consideration will be given to disinfectants, chemotherapeutic agents and antibiotics and to the discussion of resistance and immunity. The laboratory course provides an introduction to microbiological techniques, methods of sterilization, assay and control procedures in the production of antibiotics, disinfectants and biologicals.
Prerequisite: Chemistry 130 or 230 and Botany 202 or Zoology 225 or Biology 130 or 230.

PHARMACOLOGY

Pmcol 431—E. E. Daniel, G. B. Frank, D. P. MacLeod, W. A. Mahon, G. S. Marks, C. W. Nash, R. J. Reiffenstein, J. D. Taylor and Staff (2-3; 2-3)

Pharmacology—A course on the pharmacological action of drugs selected for their physiological and clinical significance. The course includes a study of basic pharmacological principles as applied to representative drugs having their primary actions on various organ systems of the body. Classes of drugs studied include general and local anaesthetics; hypnotics, sedatives, and anticonvulsants; analgesics; central nervous system stimulants; autonomic and curariform drugs; histamine and antihistaminics; cardiovascular drugs; diuretics; heavy metals and their antagonists; haemostatic agents and anticoagulants.
Instruction is given in the form of lectures, demonstrations, laboratory exercises and original work. Written and oral reports, based on original work, are required of each student.

Textbooks: Goth, *Medical Pharmacology,* 2nd Edition; Goodman and Gilman, *The Pharmacological Basis of Therapeutics,* 3rd Edition.

PHARMACY

STAFF:

Professors—M. J. Huston (Dean of the Faculty), A. J. Anderson, L. G. Chatten, B. E. Riedel
Associate Professors—A. F. Casy, R. T. Coutts
Assistant Professors—R. E. Moskalyk, R. A. Locock, A. A. Noujaim, N. K. Patel
Lecturer—J. N. Hlynka
Sessional Lecturers—W. W. Maday, D. M. Cameron

Pharm 210—M. J. Huston and Staff (3-0; 3-0)

Introductory Pharmacy—Introduction to physical pharmacy; classification of pharmaceutical preparations; pharmaceutical calculations; pharmaceutical history, literature and terminology.

Textbooks: Martin, *Remington's Pharmaceutical Sciences;* Huston, *A Textbook of Pharmaceutical Arithmetic;* Huston, *Tests and Dictionary of Scientific Words.*

Pharm 211 (0-3; 0-3)

Introductory Pharmacy Laboratory—The practical application of the principles covered in Pharmacy 210; compounding of representative pharmaceutical preparations discussed in Pharmacy 210.

Textbooks: Pharmacy 211 Laboratory Manual.
Prerequisite or Corequisite: Pharmacy 210.

Pharm 322—A. J. Anderson (3-0; 3-0)

Dispensing Pharmacy—General pharmaceutics including methods of handling and compounding typical prescriptions; dispensing specialties, posology.

Prerequisite or Corequisite: Pharmacy 210 and 211.

Pharm 323 (0-3; 0-3)

Dispensing Pharmacy Laboratory—Extensive practice in the compounding and dispensing of type prescriptions.

Textbooks: Martindale, *The Extra Pharmacopoeia,* Volume I and 1961 Addendum; Martin and Cook, *Remington's Practice of Pharmacy,* 13th Edition; Spalton, *Pharmaceutical Emulsions and Emulsifying Agents,* 2nd Edition.
Prerequisite or Corequisite: Pharmacy 210, 211, and 322.

Pharm 324—R. A. Locock (2-0; 0-0)

Pharmacognosy—A study of drugs of vegetable and animal origin; their extraction, separation, isolation and identification; the chemistry of their constituents and related substances.
Textbook: Claus and Tyler,*Pharmacognosy,* 5th Edition.
Prerequisites: Biology 130 or 230, Chemistry 230 and 250.

Pharm 325 (0-3; 0-0)

Pharmacognosy Laboratory—A macroscopic and microscopic examination of crude drugs together with chemical and physical tests for their identification and evaluation.
Textbooks: To be announced.

Pharm 326—R. E. Moskalyk (0-0; 2-0)

Introduction to Medicinal Chemistry—A study of medicinal and related substances with emphasis on their chemical properties and on correlation between structure and physiological activity.
References: Jenkins, Hartung, Hamlin and Data, *The Chemistry of Organic Medicinal Products,* 4th Edition; Wilson and Gisvold, *Textbook of Organic Medicinal and Pharmaceutical Chemistry,* 4th Edition.
Prerequisites: Chemistry 250 and 230.

Pharm 327 (0-0; 0-3)

Qualitative Analysis of Organic Medicinals—The identification of organic medicinal compounds, emphasizing the relationships of structure, functional groups and physicochemical properties.

Textbooks: Shriner, Fuson and Curtin, *The Systematic Identification of Organic Compounds* (A Laboratory Manual), 5th Edition; *Recognition of Organic Chemicals* (Scheme of Examination), Reprinted from the *Extra Pharmacopoeia,* Vol. II, 23rd Edition.

References: Vogel, *Elementary Practical Organic Chemistry,* Part 2, Qualitative Organic Analysis; Wild, *Characterisation of Organic Compounds.*

Prerequisites: Chemistry 250 and 230.

Corequisite: Pharmacy 326.

Pharm 430—L. G. Chatten (2-0; 2-0)

Pharmaceutical Analysis—Physical and chemical methods of identification and analysis; an introduction to instrumental analysis.

Textbook: Chatten, *Pharmaceutical Chemistry—Part I, Theoretical and Practical Applications.*

Pharm 431 (0-3; 0-3)

Pharmaceutical Analysis Laboratory—Analysis of pharmaceutical preparations; physical and chemical methods of analysis; practice in the use of certain analytical instruments.

Textbooks: Willard, Merritt and Dean, *Instrumental Methods of Analysis;* Chatten and Riedel, *Laboratory Manual.*

Prerequisites: Pharmacy 320 and 321.

Prerequisite or Corequisite: Pharmacy 430.

Pharm 432—N. K. Patel (2-0; 2-0)

Pharmaceutics—Dealing in an advanced manner with emulsions and emulsifying agents; sedimentation; buffering and isotonicity; parenteral preparations and cosmetics. Attention is given to compounding problems and techniques involving vehicles, flavoring agents, and selected prescriptions.

Pharm 433 (0-3; 0-3)

Pharmaceutics Laboratory—Exercises in the techniques, equipment and materials of modern dispensing; use of emulsifying agents; sedimentation studies; evaluation and selection of vehicles; preparation and evaluation of ophthalmic and other formulations, cosmetic preparations.

Textbooks: Martin, *Husa's Pharmaceutical Dispensing,* 5th Edition; Spalton, *Pharmaceutical Emulsions and Emulsifying Agents.*

References: Remington's *Practice of Pharmacy;* Martin, *Physical Pharmacy;* Martindale, *The Extra Pharmacopoeia,* Vol. I, The United States Dispensatory; Harry, *Cosmetics, Their Principles and Practice;* Sagarin, *Cosmetics Science and Technology;* Sprowls, *Prescription Pharmacy;* Cooper and Gunn, *Dispensing for Pharmaceutical Students,* 11th Edition.

Prerequisites: Pharmacy 322 and 323.

Prerequisite or Corequisite: Pharmacy 432.

Pharm 434—A. J. Anderson (2-0; 0-0)

Forensic Pharmacy—A study of the provincial and federal legislation affecting the practice of pharmacy.

Textbooks: The Food and Drugs Act and Regulations; The Alberta Pharmaceutical Association Act and Bylaws (Office Consolidation); The Proprietary and Patent Medicine Act; The Narcotic Control Act and Regulations.

Pharm 436—M. J. Huston and A. F. Casy (3-0; 3-0)

Medicinal Chemistry—A continuation of the study of organic medicinal substances and including a study of inorganic medicinals.

References: Burger, *Medicinal Chemistry,* 2nd Edition; Jenkins, Hartung, Hamlin and Data, *The Chemistry of Organic Medicinal Products,* 4th Edition; Wilson and Gisvold, *Textbook of Organic Medicinal and Pharmaceutical Chemistry,* 4th Edition; Soine and Wilson, *Rogers' Inorganic Pharmaceutical Chemistry.*

Prerequisites: Pharmacy 326 and 327.

Pharm 440—R. T. Coutts (3-0; 3-0)

Advanced Pharmaceutical Analysis—Advanced chemical and physical methods of analysis; the application of modern instrumental methods.

Prerequisites: Pharmacy 430 and 431.

Pharm 441 (0-3; 0-3)

Advanced Pharmaceutical Analysis Laboratory—Analytical problems; instrumental methods of analysis.

Pharm 442—A. J. Anderson and J. N. Hlynka (1-0; 1-0)

Advanced Pharmaceutics—Manufacturing pharmacy; physico-chemical principles involved in bulk manufacturing and preparation of sterile products.

Prerequisites: Pharmacy 432 and 433.

Pharm 443 (0-3; 0-3)

Advanced Pharmaceutics Laboratory—Experience in formulations to demonstrate the principles covered in the lectures.

Pharm 444—M. J. Huston and A. A. Noujaim (3-0; 3-0)

Pharmaceutical Therapeutics—A study of the role of drugs in the treatment of disease; medical terminology.

Prerequisite: Pharmacology 431.

Pharm 446—W. W. Maday (1-0; 1-0)

Hospital Pharmacy—Principles of operation and management of a hospital pharmacy.

Textbook: Hassan, *Hospital Pharmacy.*

Prerequisites: Pharmacy 432 and 433.

Pharm 447 (0-4; 0-4)

Hospital Pharmacy Laboratory—Practice in the operation of a hospital pharmacy, to demonstrate the principles covered in the lectures.

Corequisite: Pharmacy 446.

Pharm 448—D. M. Cameron (2-0; 2-0)

Pharmacy Management—A study of the principles involved in the successful conduct of the profession of pharmacy.

Pharm 449—Staff (1S-3; 1S-3)

Thesis—The preparation and presentation of a report based on an experimental problem or a literature survey.

Graduate Courses

Pharm 501—B. E. Riedel and A. A. Noujaim (3-3; 0-0)

Isotope Tracer Methodology—Lectures: A study of the fundamental principles of radioactivity. The importance of radioisotopes in medicine, agriculture, industry and in research. Discussion of the problems and limitations in the use of radioisotopes as tracers. Instrumentation and analysis methods. Health and safety precautions.
Laboratory: Handling and preparation of radioisotopes for counting. Counting procedures. Tracer chemical and biochemical analyses.
Textbook: Kamen, M. D., *Radioactive Tracers in Biology*, (Academic Press Inc., New York, N.Y.).

Pharm 502—B. E. Riedel and A. A. Noujaim (0-0; 3-3)

Radioisotopes—Lectures: Application of radioactive isotopes to biochemical problems in research, diagnostic medicine, agriculture and industry. Experimental procedures, application of methods of analysis, and criteria for evaluation of results.
Discussion of newer applications and methods reported in the literature.
Laboratory: A practical project involving the use of one of the available radioactive isotopes in the field of interest to the student.
Prerequisite: Pharmacy 501.

Pharm 503—B. E. Riedel and A. A. Noujaim (0-0; 3-3)

Medical Application of Radioisotopes—(a) Lectures: A study of the application of radioisotopes in medical diagnosis and treatment; control of radioisotopes in the hospital; consideration of radiation hazards. (b) Laboratory: Experience in handling radioisotopes used in medicine.
Prerequisite: Pharmacy 501.

Pharm 504—L. G. Chatten (3-0; 0-0)

Structure-Action Relationships of Organic Medicinals—Relationship between chemical structure and biological action of organic medicinal agents. The course deals with a variety of timely topics.

Pharm 506 (1S-0; 1S-0)

Graduate Seminar—Reports on topics related to the fields of specialization of the graduate student.

PHYSICAL EDUCATION

First-year students are required to register in Phys. Ed. 218—Men or Phys. Ed. 228—Women.

P Ed 218—Physical Education Staff (0-2; 0-2)

Recreational Activities—(Men)—Emphasis on the fundamentals of the following recreational and fitness activities: circuit training, aquatics, handball, badminton, volleyball, tumbling and apparatus.

P Ed 228—Physical Education Staff (0-2; 0-2)

Recreational Activities—(Women)—Emphasis on the fundamentals of the following recreational and fitness activities: aquatics, movement fundamentals, tennis, badminton, dance and golf.

PHYSIOLOGY

Physl. 361 (3-3; 3-3)

Human Physiology—This course comprises the essentials of human physiology, and the laboratory program is designed to illustrate principles of animal function. This course will normally be taken by students in the Faculties of Pharmacy and Arts and Science, but may also be taken by students in other Faculties.

Prerequisites: Biology 130 or 230 or Zoology 220 or 225. Chemistry 250 or 350.

VETERINARY SCIENCE

Vet S 404—D. C. Secord (1-0; 1-0)

Veterinary Science—Veterinary biologicals; general sanitary measures for control of animal and poultry diseases; review of deficiency ailments; prevalent animal diseases with reference to recent pharmaceutical preparations and biological products used in treatment and prevention; some common sporadic ailments of farm animals and their remedies.

XIX

The Faculty of Physical Education

INFORMATION, REGULATIONS, COURSES

INTRODUCTION

A School of Physical Education was organized under General Faculty Council in 1954. The degree course in Physical Education has been offered since 1950. The program originally led to the degree of Bachelor of Education in Physical Education, which has been superseded by the degree of Bachelor of Physical Education. Effective April 1, 1964 the School became the Faculty of Physical Education.

The faculty also offers a four-year program leading to the degree of Bachelor of Arts in Recreation Administration.

In addition to these two programs, the Faculty provides instruction in teaching methods in both health and physical education for students in the Faculty of Education, conducts service classes (required) for first-year students in all faculties, organizes and supervises intramural programs and acts in an advisory capacity for the intercollegiate athletic programs.

Students holding the degree of B.P.E. or its equivalent may undertake graduate study in physical education leading to the degree of Master of Arts or Master of Science. The Calendar of the Faculty of Graduate Studies should be consulted.

Professional Opportunities

The demand for qualified people in both the fields of physical education and recreation continues to increase each year, far exceeding the supply.

Teacher Education

The Faculty of Physical Education is responsible for courses in health and physical education offered to students in the Faculty of Education.

A major in physical education is offered to students in the elementary route. Those in the secondary route may elect to enroll in two optional courses in physical education. Normally, teachers qualifying to teach physical education in the secondary schools will be expected to complete the Bachelor of Physical Education degree before enrolling in the Faculty of Education.

All first year students registered in the Faculty of Education are required to enroll in Phys. Ed. 218 or 228.

Dress: The prescribed gymnasium costume is:

Women	*Men*
Shorts (dark green)	Shorts
Sports blouse (white)	T-shirts
Socks (white)	Socks (white)
Running shoes	Running shoes

The Service Program

It is the aim of the Faculty of Physical Education to make a major contribution toward the physical, mental and social life of each student through instruction and participation in physical recreational activities.

All first-year students are required to take two hours of physical education each week. Those excepted from this regulation are:

1. Students declared physically unfit by the University Health Services,
2. Students over 25 years of age.

Individual lockers, towels and shower facilities are available for all students. The program is conducted in the Physical Education Building.

Dress: The required gymnasium costume is identical to the one outlined in the foregoing section, "Teacher Education".

For details of courses offered in the Service Program, see DETAILS OF COURSES—V.

The Intramural Program

The Faculty of Physical Education, with the cooperation of the University Athletic Board, organizes and administers a comprehensive program of intramural sports. Primary purposes of the program are to develop recreational skills and to encourage sportsmanship and friendly relations among the students of the University through athletic competition. Individual and group competitive sports for men and women include tennis, golf, track and field, cross-country running, basketball, hockey, volleyball, touch football, swimming and figure skating. Facilities include gymnasia, a swimming-pool, outdoor playing fields and the University ice arena.

Intercollegiate Athletics

As a member of the Western Canada Intercollegiate Athletic Association, the University provides opportunities for men and women to compete in intercollegiate sports. Included in the activities for men are golf, tennis, cross-country, badminton, volleyball, basketball, hockey, wrestling, swimming, track and field, football, fencing and curling. Women compete in tennis, golf, badminton, and track and field, and hold two sports weekends with member universities. Basketball and curling are played during one weekend and volleyball, swimming and figure skating during the other.

MATRICULATION REQUIREMENTS

(1) For the Degree of Bachelor of Physical Education

A high school diploma with 50% or higher standing and at least a 60.0% average in the following Grade XII courses:

(a) English 30,
(b) Social Studies 30,
(c) Chemistry 30,
(d) *Three* of: French 30, German 30, Latin 30, or Ukrainian 30 (or another language at an equivalent level), Physics 30, Biology 30 (or 32 if taken before September, 1965), Mathematics 30.

Note: It is strongly recommended that students planning to register in physical education elect to take Biology 30 as one of the three optional courses.

Beginning in September, 1967, matriculation requirements for the degree of Bachelor of Physical Education will be as follows:

(a) English 30
(b) Social Studies 30
(c) Biology 30
(d) Either Chemistry 30 or Physics 30
(e), (f) Two of: French 30, German 30, Latin 30 or Ukrainian 30, (or another language at an equivalent level), Mathematics 30, Physics 30, Chemistry 30.

Note: Students who are unable to present standing in Biology 30 may be admitted, but will have to take Biology 130 in their first year, and to defer Physiology 260 until their second year.

(2) For the Degree of Bachelor of Arts in Recreation Administration

A high school diploma with 50% or higher standing and at least a 60.0% average in the following Grade XII courses:

(a) English 30,
(b) Social Studies 30,
(c) *Four* of: French 30, German 30, Latin 30 or Ukrainian 30 (or another language at an equivalent level), Biology 30 (or 32 if taken before September, 1965), Mathematics 30, *Mathematics 31, Music 30, Physics 30.

*Acceptable option if credit obtained by Departmental examination during or after June, 1962.

These general regulations notwithstanding, the University may in its discretion refuse admission to any applicant. For example, this regulation normally will be applied where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements of the University of Alberta.

PROGRAMS OFFERED IN THE FACULTY OF PHYSICAL EDUCATION

(1) The Degree of Bachelor of Physical Education

First Year

1. Approved option.
2. English 200 or 210.
3. Psychology 202 or 212.
*4. Physiology 260.
5. Physical Education 243: Introduction to Physical Education.
6. Physical Education 205: Activity Course.
7. Physical Education 207: Activity Course.
8. Physical Education 211: Activity Course.
9. Physical Education 215: Activity Course.

* Students lacking Biology 30 will take Biology 130 in the first year and Physiology 260 in the second year.

Second Year

†1. Approved option.
2. Physical Education 305: Activity Course.
3. Physical Education 307: Activity Course.
4. Physical Education 311: Activity Course.
5. Physical Education 315: Activity Course.
6. Physical Education 362: Human Anatomy and Kinesiology.
7. Physical Education 371: Prevention and Treatment of Athletic Injuries.
8. Physical Education 375: Tests and Measurements in Health and Physical Education.
9. Physical Education 389. Outdoor School.
10. Physical Education 392: Health Education in Secondary Schools.
11. Two approved Arts or Science options.

† Physiology 260 if not taken in first year.

Third Year

1. Physical Education 401: Activity Course.
2. Physical Education 403: Activity Course:
3. Physical Education 405 (Women): Activity Course.
4. Physical Education 407 (Women): Activity Course.
5. Physical Education 409 (Men): Activity Course.
6. Physical Education 417 (Men): Activity Course.
7. Physical Education 442: Organization and Administration of Health and Physical Education.
8. Recreation 452: Community Recreation.
9. Physical Education 467: Adapted Physical Education.
10. Physical Education 473: Physiology of Exercise.
11. Physical Education 482: Observation and Practice in Field Work.
12. Two approved Arts or Science options.

A pass mark of 60 per cent is required in each activity course in the B.P.E. program.

Graduation Requirements

To be granted the B.P.E. degree or the B.A. degree in Recreation Administration, a student must obtain a passing mark or better in all courses in the final two years of the respective degree program, obtaining an average of 60 percent (or the equivalent in terms of the new nine-point grading system).

Notes:

i. A student will not be allowed to write more than five supplemental examinations in full courses or the equivalent, for the purpose of obtaining passing marks, or of raising his average to the required level.

ii. A student will not be allowed to write more than two supplemental examinations in full courses or equivalent in any year. (This regulation may, in exceptional circumstances, be relaxed for first-year students).

iii. A student who repeats a year will be granted no supplemental privileges in the courses taken that year and must pass all courses in the repeated year with a 60 percent average (or the equivalent in terms of the new nine-point grading system) to be allowed to continue.

iv. The privilege of repeating a year will be granted to a student not more than once during his candidacy for a degree in this Faculty unless by special permission of the Dean.

(2) The Degree of Bachelor of Arts in Recreation Administration

First Year

1. English 200 or 210
2. Sociology 202
3. Psychology 202
4. Approved Mathematics or Science Option
5. P.E. 205
6. P.E. 215
7. P.E. 243

Second Year

1. Sociology 320
2. Approved Arts or Science Option
3. Art 230 or Education C.I. 213
4. Drama 250
5. P.E. 307
6. Recreation 353—Camp Counselling
7. Recreation 355—Introduction to Community Recreation
8. Recreation 357—Methods and Materials in Recreation Leadership
9. P.E. 389—Outdoor School

Third Year

1. Sociology 350, 460 or Psychology 353 and 383
2. Education C.I. 213 or Art 230
3. Drama 240
4. An approved Option
5. P.E. 401—Activity Course
6. P.E. 403—Activity Course
7. Recreation 455—Recreation Administration
8. Recreation 457—Field Work in Public and Semi-Private Agencies

Fourth Year

1. An approved Sociology or Psychology Option
2. An approved Option
3. Business 250
4. Recreation 458—Principles of Recreation
5. Recreation 459—Planning Recreation Facilities
6. Recreation 465—Community Organization
7. Approved Physical Education Activity Option
8. Approved Physical Education Activity Option

(3) Graduate Study

M.A. or M.Sc. Programs for persons holding the degree of B.P.E. or its equivalent.

The Faculty of Physical Education offers a program leading to the Master of Science Degree or the Master of Arts Degree. Well-equipped facilities are available for a limited number of graduate students. Graduate instruction is offered in the scientific principles, philosophy, and supervision of physical education, and the administration of recreation. Areas of research specialization include physiology of exercise, sociology, psychology of motor learning and history. See the calendar of the Faculty of Graduate Studies.

Course selection will be made in consultation with an adviser appointed by the Graduate Committee of the Faculty of Physical Education.

(4) Teacher Education

Elementary Route Major

1. P.E. 202
2. P.E. 325
3. P.E. 327
4. P.E. 419
5. P.E. 422
6. P.E. 429

Secondary Route Options

1. P.E. 232
2. P.E. 332

Secondary Route Options in Health Education

1. P.E. 392
2. P.E. 492

(5) B.Ed. Programs for Graduates in Physical Education

Physical Education students seeking a teaching certificate will take the following courses:

(1) Secondary route:
1. Ed. Adm. 461
2. Ed. Psy. 476*
3. Ed. CI 450
4. Ed. Fdn. 492*
5. Ed. Method, major field
6. Ed. Fdn. 414 or Ed. Psy. 478

Successful completion of these six courses entitles the student to obtain an interim Professional Certificate.

*Students lacking prerequisites for Ed. Psy. 476 and Ed. Fdn. 492 must obtain the prerequisites before taking these courses. They will be eligible to receive the Standard S certificate on satisfactory completion of the prerequisites and the other four courses listed above, and the Interim Professional certificate on satisfactory completion of Ed. Psy. 476 and Ed. Fdn. 492 in addition.

7-11. Five approved courses, at least two of which must be in Education and at least two of which must be in Arts and Science.

Satisfactory completion of all eleven courses permits the student to apply for the B.Ed. degree.

(2) Elementary route: 1. Ed. Adm. 461
2. Ed. Psy. 476*
3. Ed. CI 400
4. Ed. Fdn. 492*
5. Ed. CI 402
6. Ed. CI 404

Successful completion of these six courses entitles the student to obtain an interim Professional Certificate.

*Students lacking prerequisites for Ed. Psy. 476 and Ed. Fdn. 492 must obtain the prerequisites before taking these courses. They will be eligible to receive the Standard E certificate on satisfactory completion of the prerequisites and the other four courses listed above, and the Interim Professional certificate on satisfactory completion of Ed. Psy. and Ed. Fdn. 492 in addition.

7-11. Five approved courses, at least two of which must be in Education and at least two of which must be in Arts and Science.

Satisfactory completion of all eleven courses permits the student to apply for the B.Ed. degree.

DETAILS OF COURSES

NOTE: In the case of courses which are given throughout the winter session, the weekly hours of instruction are set out for both terms. The first figure in each term indicates lecture-hours and the second laboratory-hours, Even-numbered courses are full courses; odd-numbered courses are half courses.

Professors—Patricia L. Austin, M. L. Howell, W. D. Smith, M. L. Van Vliet (Dean of the Faculty)

Associate Professors—A. F. Affleck, Ruby O. Anderson, Audrey M. Carson, A. W. E. Eriksson, C. J. Drake, G. Fracas, R. Macnab, H. J. McLachlin, S. Mendryk, M. F. R. Smith

Assistant Professors—P. Conger, D. Darwick, G. Elliott, L. Fournier, R. G. Glassford, R. B. Wilberg

Lecturers—S. Robbins, Dorothy J. Harris

Instructors—M. Ellis, Lorna E. Reid

PHYSICAL EDUCATION COURSES

I. BACHELOR OF PHYSICAL EDUCATION

Activity Courses for Men

P Ed 205—C. Drake, S. Robbins (1-2; 0-0)

Activity Course—Theory, practice and teaching of soccer and volleyball

P Ed 207—A. Carson and Staff (1-2; 0-0)

Activity Course—An introduction to the teaching of physical education in the elementary schools.

P Ed 211—G. Elliott (0-0; 1-2)

Activity Course—Theory, practice and teaching of gymnastics.

P Ed 215 (0-0; 1-2)

Activity Course—Theory, practice and teaching of aquatics with emphasis on fundamental skills and stroke techniques.

P Ed 305—Physical Education Staff (1-2; 0-0)

Activity Course—Theory, practice, teaching and coaching of basketball.

P Ed 307—A. Carson (1-2; 0-0)

Activity Course—Theory, practice and teaching of folk and social dance.

P Ed 311—G. Elliott (0-0; 1-2)

Activity Course—Theory, practice and teaching of gymnastics for men. Emphasis on class organization and teaching methods.

Prerequisite: Physical Education 211.

P Ed 315—M. F. R. Smith (0-0, 1-2)

Activity Course—Advanced aquatics with emphasis on swimming and diving instruction, coaching, and organization of programs.

Prerequisite: P.E. 215 or equivalent.

P Ed 389—W. D. Smith and Staff (80 hours)

Outdoor School—Theory, practice and teaching of tennis, archery, golf and Outdoor Education. Fundamental skills of touch football, borden ball and speedball.

P Ed 401—G. Elliott and L. J. Fournier (1-2; 0-0)

Activity Course—Theory, practice and teaching of track and field with emphasis on coaching techniques, organization and officiating of meets.

P Ed 403—L. J. Fournier (0-0; 1-2)

Activity Course—Theory, practice and teaching of badminton, curling and skiing.

P Ed 409—C. J. Drake, G. Fracas (0-0;-1-2)

Activity Course—Theory, practice, teaching and coaching of hockey and wrestling.

P Ed 417—G. Fracas (1-2; 0-0)

Activity Course—Theory, practice, teaching and coaching of football.

Activity Courses for Women

P Ed 205 (1-2; 0-0)

Activity Course—Fitness for activity. Theory, practice and coaching of volleyball.

P Ed 207—A. Carson and Staff (1-2; 0-0)

Activity Course—An introduction to the teaching of physical education in the elementary schools.

P Ed 211 (0-0; 1-2)

Activity Course—Theory, practice and teaching of gymnastics.

P Ed 215—P. Conger (0-0; 1-2)

Activity Course—Theory, practice and teaching of aquatics with emphasis on fundamental skills and stroke techniques.

P Ed 305—R. Anderson (1-2; 0-0)

Activity Course—Theory, practice, teaching and coaching of basketball.

P Ed 307—A. Carson (1-2; 0-0)

Activity Course—Theory, practice and teaching of folk and social dance.

P Ed 311 (0-0; 1-2)

Activity Course—Theory, practice and teaching of gymnastics. Emphasis on class organization and teaching methods.

Prerequisite: Physical Education 211.

P Ed 315—D. Darwick (0-0; 1-2)

Activity Course—Advanced aquatics with emphasis on swimming and diving instruction, coaching, and organization of programs.

Prerequisite: P.E. 215 or equivalent.

P Ed 389—W. D. Smith and Staff (80 hours)

Outdoor School—Theory, practice and teaching of tennis, archery, golf and Outdoor Education. Fundamental skills of field hockey.

P Ed 401—A. Carson (1-2; 0-0)

Activity Course—Theory, practice and teaching of track and field with emphasis on coaching techniques, organization and officiating of meets.

P Ed 403—R. Anderson (0-0; 1-2)

Activity Course—Theory, practice and teaching of badminton, curling and skating.

P Ed 405—D. Harris (0-0; 1-2)

Activity Course—The study of techniques, improvisation and composition of modern dance.

P Ed 407—R. Anderson (1-2; 0-0)

Activity Course—Comprehensive study of international folk dance.

Theory Courses for Men and Women

P Ed 243—W. D. Smith and Staff (3-0; 0-0)

Introduction to Physical Education—A survey of the field of physical education with emphasis on factual information directed toward the development of a scientific program of physical education. This course will include a brief study of the history of physical education as well as underlying philosophies.

P Ed 362—H. J. McLachlin, G. Elliott (2-2; 2-2)

Human Anatomy and Kinesiology—Gross anatomy; the skeletal and muscular structure, the circulatory, digestive and neural systems and their functionings in activities relating to physical education. Analysis of complex movements, specialized skills and motor co-ordination in terms of the mechanics of skeletal and muscular movements.

P Ed 371—S. Mendryk (0-0; 1-2)

Scientific Bases of Athletic Conditioning and Training—Theoretical and practical experience in massage, elementary physiotherapy, and preventive techniques.

P Ed 375—R. Macnab (1-2; 0-0)

Tests and Measurements in Health and Physical Education—Criteria for selection of tests and the place and potential use of measurement in fields of health and physical education. Study of current tests from both practical and theoretical standpoints. Use of tests in the administration of physical activity programs.

P Ed 392—A. W. E. Eriksson (3-0; 3-0)

Health Education in Secondary Schools—Personal and environmental school health with special emphasis on methods and materials in health instruction.

P Ed 442—W. D. Smith and G. Fracas (3-0; 3-0)

Organization and Administration of Health and Physical Education—An analysis of factors involved in planning, directing, staffing, co-ordinating, budgeting and reporting with respect to comprehensive junior and senior high school programs in health instruction, the required program, intramural sports and interscholastic athletics.

Recreation 452—L. J. Fournier, A. Affleck (3-0; 3-0)

Community Recreation—A study of the philosophy, principles and practices of recreation applied to problems of organization, administration and supervision on a local, provincial and national basis.

P Ed 467—P. Austin (3-0; 0-0)

Adapted Physical Education—Prerequisites: Phys. Ed. 362, 392.

P Ed 473—R. Macnab (0-0; 2-1)

Physiology of Exercise—Physiological effects of muscular exercise, physical conditioning and training. Significance of these effects for health and for performance in activity programs.

Prerequisite: One year course in general human physiology.

P Ed 482—R. Anderson and C. J. Drake (3-0; 3-0)

Observation and Practice in Field Work—Field work experience in teaching, officiating, recreation and intramural programs. Preparation of graduation essay.

II. BACHELOR OF ARTS IN RECREATION ADMINISTRATION

P Ed 205

Activity Course—see B.P.E. courses.

P Ed 215

Activity Course—see B.P.E. courses.

P Ed 243

Introduction to Physical Education—see B.P.E. courses

P Ed 307

Activity Course—see B.P.E. courses.

Rec 353 (0-0; 3-0)
Camp Counselling—Fundamentals of camping, recruitment and selection of camp staff, development of the counsellor training program, supervision and evaluation of camp personnel.

Rec 355 (3-0; 0-0)
Introduction to Community Recreation—History of recreation movement, theories of play, public and private agency administration.

Rec 357 (0-0; 1-2)
Methods and Materials in Recreation Leadership—Techniques in skill, instruction, conduct of clinics and public meetings, and social recreation.

P Ed 389
Outdoor School

P Ed 401
Activity Course (Men and Women)—see B.P.E. courses.

P Ed 403
Activity Course (Men and Women)—see B.P.E. courses.

Rec 455 (3-0; 0-0)
Recreation Administration—Public, private and school recreation administrative procedures relative to planning programs, facilities and sites; directing; staffing; coordinating; budgeting and reporting.

Rec 457 (0-0; 1-3)
Field Work in Public and Semi-Private Agencies—Prerequisites: Recreation 355 and Recreation 357 or consent of the instructor.

Rec 458 (3-0; 3-0)
Principles of Recreation—A critical study of selected psychological, sociological and educational theories with the view of formulating a rationale upon which recreational leadership methods and administrative decisions may be based.

Rec 459 (0-0; 3-0)
Planning Recreation Facilities—Prerequisites: Recreation 355 and Recreation 455 or consent of instructor.

Rec 465 (3-0; 0-0)
Community Organization—The analysis of the social and political processes through which groups and individuals work together to mobilize resources and establish relationships.

III. GRADUATE COURSES

P Ed 501 (0-6; 0-0)
Research

P Ed 503 (0-0; 0-6)
Research

P Ed 548 (3-0; 3-0)
Scientific Principles of Physical Education

P Ed 552 (3-0; 3-0)
Administrative Problems in Physical Education and Recreation

P Ed 564 (3-0; 3-0)
Directed Studies

P Ed 567 (0-0; 3-0)
Seminar in Human Motor Performance—Prerequisite: Psychology 464.

P Ed 569 (3-0; 0-0)or(0-0; 3-0)
Physical Growth and Development

P Ed 578 (3-3; 3-3)
Research Methods in Health, Physical Education and Recreation

P Ed 588 (3-0; 3-0)
Historical and Comparative Physical Education

IV. PHYSICAL EDUCATION COURSES FOR FACULTY OF EDUCATION STUDENTS

P Ed 202—A. Carson and Staff (3-3; 3-3)
Introduction to Elementary School Physical Education—A study of children at play. Movement education leading to the development of skill in various fields of physical activity.

P Ed 232 (3-3; 3-3)
Physical Education Curriculum and Instruction (Secondary)—Planning and teaching secondary school physical education with emphasis on basic activities and intramural athletics.

P Ed. 325 (3-0; 0-0)
Scientific Principles of Elementary School Physical Education—A study of anatomy, physiology of exercise and kinesiology as it relates to the physical growth and development of children aged 6 to 12.
Prerequisite: P.E. 202.

P Ed 327 (0-0; 0-3)
Dance—A study of the basic principles of movement and the use of these in the communication of ideas and feelings through dance and dance drama.
Prerequisite: P.E. 202 or consent of department

P Ed 332 (3-3; 3-3)
Principles of Physical Education (Secondary)—Analysis of factors derived from foundation sciences and philosophies as they affect activity selection and basic objectives at the secondary school level.

P Ed 334 (Summer Session only) (3-3; 3-3)
Methods and materials relating to the core curriculum for junior and senior high schools.

P Ed 337 (1-2; 0-0)or(0-0; 1-2)
Physical Education Curriculum and Instruction—Methods and materials in the teaching of elementary school health and physical education.

P Ed 338 (Summer Session only) (3-3; 3-3)

Analysis of selected individual, dual and team sports related to the core curriculum.

Prerequisite—P.E. 334 or consent of department.

P Ed 392 (3-0; 3-0)

Health Education in Secondary Schools—Personal and environmental school health with special emphasis on methods and materials in health instruction.

P Ed 419 (0-0; 3-0)

Problems and Trends in Elementary School Health and Physical Education—Prerequisites: P.E. 202, 325, 327, 422.

P Ed 422 (2-2; 2-2)

Individual and Team Activities—Prerequisite: P.E. 202 and Junior Red Cross Swimming award or equivalent.

P Ed 429 (3-3; 0-0)

Advanced Gymnastics, Dance and Games—Students will be encouraged to specialize in an area of their choice.

Prerequisites: P.E. 202, 325, 327, 422.

P Ed 492 (3-2; 3-2)

Community Health—Consideration of current research of disease concepts and examination of community attitudes and pressures affecting health education. Field research includes hospitals, clinics, institutions and schools.

V. THE SERVICE PROGRAM

(Required of all first-year students.)

P Ed 218—Physical Education Staff (Men) (0-2; 0-2)

Recreational Activities—Emphasis on the fundamentals of the following recreation and fitness activities: circuit training, aquatics, handball, badminton, volleyball, tumbling and apparatus.

P Ed 226—Physical Education Staff (Women) (2-0; 2-0)

Physiotherapy Service Program—This course will include rhythmics, gymnastics, active games and dancing, suitable for all age groups. It will also include swimming and water safety techniques with emphasis on their use in the treatment of patients. (For students in the School of Rehabilitation Medicine.)

P Ed 228—Physical Education Staff (Women) (0-2; 0-2)

Recreational Activities—Emphasis on the fundamentals of the following recreational and fitness activities: aquatics, movement fundamentals, tennis, badminton, dance and golf.

COURSES OFFERED BY OTHER DEPARTMENTS

ART

Art 230 (1-4; 1-4)

Fundamentals of Design—The study and practical application of principles of composition and picture-making, methods of construction in design, and the use of conventional and abstract forms.

Art 240 (3-3; 3-3)

Fundamentals of Drawing—Theory and practice of drawing; analysis of masters' drawings; study of line, form, pattern, light and shade; portrait and figure construction; life drawing, using both long and quick poses.

BIOLOGY

Biol 130 (3-3; 3-3)

Introductory Biology—An introduction to Biology, with emphasis on principles. Not open to students with credit in Biology 30.

Biol 230 (3-3; 3-3)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This course is prerequisite to most senior biology courses.

Prerequisite: Biology 30 or Biology 130.

BUSINESS

Bus 250 (3-0; 3-0)

Business Principles—Survey of the functional areas of business.

DRAMA

Drama 240 (3-0; 3-0)

Voice and Speech—An intensive course in voice and speech improvement with emphasis upon the oral interpretation of prose, poetry, and dramatic literature.

Drama 250 (3-2; 3-2)

Acting Technique and Production—(a) Acting: Practical and theoretical through improvisation, stage performance and discussion. Emphasis is placed on the development of the actor through preparation for a role, acting scenes, and basic voice and body work. Elementary makeup. (b) Production: Practical work in technical practice.

EDUCATION

Ed CI 213 (3L; 0-0) or (0-0; 3L) or (1½L; 1½L)

Curriculum and Instruction in Elementary School Music.

ENGLISH

Engl 200 (3-0; 3-0)

A Survey of English Literature from Chaucer to the Twentieth Century—A close study of representative masterpieces. Essays and tests on the prescribed literature will be given to afford practice in setting down ideas in good English.

Engl 210 (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

PHYSIOLOGY

Physl 260 (3-1; 3-1)

Elementary Human Physiology—A lecture and laboratory demonstration course for students in Physical Education and Baccalaureate students in Nursing. This course is concerned with human physiology and the laboratory demonstration are designed to illustrate important aspects of human physiology using modern techniques.

PSYCHOLOGY

Psyco 202 (3-0; 3-0)

Introduction to General Psychology—A survey of problems ,methods and principles in various fields of psychology.

Psyco 212 (3-0; 3-0)

General and Developmental Psychology—A survey of problems, methods and principles in several fields of psychology, with particular emphasis on child, adolescent and adult development and behaviour.

Psyco 464 (2-2; 0-0)

Motor Skills—A basic course covering Reaction Time and Motor Learning; the acquisition and perfection of skills and other factors related to Motor Performance.

Prerequisite: Psychology 202.

SOCIOLOGY

Soc 202 (3-0; 3-0)

Introductory Sociology—An introductory analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society is analysed in terms of its structure, culture and social ranking schemes. The interrelationships between the various institutions (e.g. family, church, school, government) are considered. The processes are examined whereby the individual is socialized into society, as are the sources of conformist and non-conformist behavior.

NOTE: Third year or more advanced students are encouraged to take 402 rather than 202.

Soc 320 (3-0; 3-0)

Social Problems—An analysis of deviant behavior (e.g. crime, juvenile delinquency, drug addiction) and an analysis of social disorganization including world population crisis, urban and rural problems, industrial and other problems.

Soc 350 (3-0; 3-0)

The Human Community and Community Development—A study of human communities; their institutional structure, ecological factors associated with patterns of growth, community relations, community planning.

Prerequisite: A first course in Sociology.

Soc 460 (3-0; 3-0)

Social Organization—Theories of social organization, analysis of such forms of social organization as kinship groups, bureacracy, economic system, science, etc., and their inter-relationship in functioning social systems.

Prerequisite: A first course in sociology.

XX

The School of Rehabilitation Medicine

All enquiries regarding admission to the School of Rehabilitation Medicine, University of Alberta, should be addressed to:

Director,
School of Rehabilitation Medicine
University of Alberta, Edmonton

INFORMATION, REGULATIONS, COURSES

(1) INTRODUCTION

The training in rehabilitation procedures has been established to provide professional personnel, who, under the direction of the medical profession, will aid in the recovery and re-establishment of disabled people suffering from physical and mental disorders.

Licensing

A graduate from this institution will be qualified to serve in Provincial and General hospitals, Mental Institutions, Clinics, Armed Services and in private practice. He or she will be eligible to register with the parent Canadian professional organizations and may expect reciprocity in England, the Commonwealth and the International organizations in Physical Therapy and Occupational Therapy. Graduates intending to practise outside Alberta will have to comply with the local state or provincial licensing requirements regardless of their professional qualifications. Those planning to practise outside Alberta may seek further information from:

1. (a) The Canadian Physiotherapy Association,
   64 Avenue Road, Toronto 5, Ontario.
   (b) The Canadian Association of Occupational Therapists,
   331 Bloor Street West, Toronto 5, Ontario.
2. In England:
   (a) The Chartered Society of Physiotherapy,
   Tavistock House (South),
   Tavistock Square, London, W.C. 1, England
   (b) The Association of Occupational Therapists,
   251 Brompton Road,
   London, S.W. 3, England.
3. In the United States:
   (a) The American Physical Therapy Association,
   1790 Broadway, New York 19, N.Y.
   (b) The American Occupational Therapy Association,
   250 W 57th St., New York, 19, N.Y.
4. Other countries:
   Information may be obtained from the Canadian Physiotherapy Association and Canadian Association of Occupational Therapists, Toronto.

Association Membership

The Canadian Physiotherapy Association and the Canadian Association of Occupational Therapists have special post-graduate internship requirements for diploma students from all Canadian Universities, and the graduate will be required to make up these necessary hours under the direction of the professional body concerned before professional registration can be obtained.

Diploma Programs in Physical Therapy and Occupational Therapy

The diploma programs comprise a three year curriculum consisting of organized courses in the basic sciences of Anatomy, Physiology and Biology as well as English, Psychology, and professional courses in Medicine, Surgery, Psychiatry and Rehabilitation procedures.

In the second year the student will be required to intern in approved institutions under the supervision of qualified Physiotherapists and Occupational Therapists. Provision is made for the payment of an honorarium by the hospital or clinic where the students intern during the summer months.

In all years of the three year programs some material will be common to both classes of students whether they intend to practice Physical Therapy or Occupational Therapy. This has been done in order to give the student a more basic background as well as a realistic and practical approach to the overall field of Rehabilitation. At the end of the first three months the student will decide which field he or she intends to pursue and will confirm his or her registration in either Physical Therapy or Occupational Therapy.

(2) **ADMISSION REQUIREMENTS**

A candidate for admission to the first year of the diploma course must have reached her seventeenth birthday on or before the 1st of October. Only under exceptional circumstances will a candidate be admitted under the age of 17 or over the age of 35 years.

Male students are accepted.

A student registered in first year will be required to have a chest x-ray and submit to a tuberculin test.

The applicant will be required to have Senior Matriculation or its equivalent, including "B" or higher standing in each of the following subjects:

English 30
Social Studies 30
Mathematics 30
Biology 30
One of Physics 30 or Chemistry 30
One of Foreign Language 30 or *Mathematics 31

The student must have an average standing of 60% or higher in these courses.

These general regulations notwithstanding, the University may, at its discretion, refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain nominal entrance requirements at the University of Alberta.

In the event that high school education was received outside of Alberta or was completed prior to 1954—documentary evidence of academic record should be submitted for comparison with the present Alberta requirements.

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*Acceptable if credit obtained by means of a Departmental examination during or after June, 1962.

Candidates must have satisfactory personality and physique and must meet the health and physical requirements of the University Health Services for the course in Physical or Occupational Therapy.

The course is limited to forty students per year. It is open on equal terms to applicants from Alberta and from outside the province. In all cases, preference will be given on the basis of academic standing.

All applicants will be required to arrange for an interview at the school prior to registration. A passport-size photograph must accompany each application.

Registration

Enrolment will take place on the dates in September shown in the Academic Schedule. Each applicant accepted for admission to the first year of the course will receive a card of admission which will indicate the day and time at which the applicant must attend at the University for registration.

A medical certificate form, which is obtained from the Registrar at the same time as the application form, must be completed and signed by the applicant's family physician and must accompany the application form when it is returned to the Registrar.

Budget

An estimated annual budget in the neighborhood of $1,600 would be required by a student who is not able to live at home. This includes room and board, books, tuition fees, student fees, travelling expenses, and other incidentals.

Uniforms

In their first year students will be expected to provide a short-sleeved white cotton blouse, (T-shirt for male students), green shorts, white running shoes and white socks. Female physiotherapy students will require two white cotton uniforms, white stockings, and a pair of white oxfords. Male physiotherapy students will require dark grey trousers, white shirt, white shoes and white socks. Students in Occupational Therapy will be advised as to their uniform requirements in their second year.

Educational and Clinical Facilities

Undergraduates in the second and third years of the three-year diploma courses will rceive instruction in local institutions.

During undergraduate internship in an approved institution, the student may expect to receive from the institution, in lieu of room and board, an honorarium which is at present not less than $50.00 per month.

(3) REQUIREMENTS FOR PROMOTION AND GRADUATION

Students are subject to the regulations found elsewhere in this calendar.

Students will be promoted in terms of the following policies:

At the end of each academic year the council of the School of Rehabilitation Medicine reviews the students' records, in theory and practice. When a student fails to meet the 60% standard set by the School of Rehabilitation Medicine, the student's overall record is carefully considered by the Council of the School,

which may, depending on the circumstances, allow the student to repeat the year or require withdrawal from the school.

Recommendations for promotion are dependent on the following regulations:

(a) A supplemental may be granted in not more than two subjects in each year. provided the overall average is 60%. The pass mark for supplemental examinations is 50%.

(b) In order to proceed to third year a student must have successfully completed the academic subjects and have completed the required number of hours in clinical training both during the academic term and summer internship.

Recommendations for graduation will be based on fulfillment of the following requirements:

1. A grade of at least 50% in each subject and an overall average of 60% in each of the three years.
2. Satisfactory completion of the required number of hours in clinical training in summer and academic sessions.

For the purpose of reaching an average mark in the work of each year, a scheme for determining a weighted average has been adopted. A notice outlining the basis on which this is done will be posted during the session.

NOTE: With the introduction of a new nine-point grading system in 1966-67 requirements equivalent to those outlined above will be adopted.

STAFF:—

Professor—

Assistant Professors—L. G. Allbon, Ruth O. F. Bradshaw, A. G. Faulds

Lecturers—Elizabeth F. Rowand, Esmé Dardier, Mrs. O. Fifield

Sessional Lecturers—Dr. J. R. Fowler, Mrs. J. McIntyre

Members of the Departments of—Anatomy, Botany, English, Medicine, Nursing, Obstetrics and Gynaecology, Pathology, Physiology, Psychiatry, Psychology, Surgery and Zoology.

OCCUPATIONAL THERAPY PROGRAMME

Subject	Course Number Old	New	Hrs. Per Week 1st Term	2nd Term	Total
First Year:					
*Anatomy	*Anatomy 200	Anat 200	(3-5)	(3-5)	208
*Biology	Biology 230	Biol 230	(3-3)	(3-3)	156
*English	English 210	Engl 210	(3-0)	(3-0)	78
Occupational Therapy	Occup. Therapy 200	Rehab 205	(0-0)	(2-6)	104
*Physical Education	Phys. Ed. 226	P Ed 226	(0-2)	(0-2)	52
*Psychology	Psychology 212	Psycho 212	(3-0)	(3-0)	78
*Rehabilitation	Rehabilitation 200	Rehab 210	(1-5)	(0-0)	78
Second Year:					
Applied Anatomy	Applied Anatomy 300	Rehab 316	(0-2)	(0-2)	52
Hospital Internship	Hospital Internship 301 (O.T. Clinical Practice)	Rehab 326	(0-9)	(0-9)	234
*Medicine & Surgery	Medicine & Surgery 300	Rehab 330	(2-0)	(2-0)	52
Occupational Therapy	Occup. Therapy 300	Rehab 305	(2-6)	(2-4)	182
*Physiology	Physiology 261	Physl 261	(3-3)	(3-3)	156
*Psychiatry	Psychiatry 300	Rehab 335	(1-0)	(1-0)	26
Sociology	Sociology 202	Soc 202	(3-0)	(3-0)	78
Hospital Internship	Hospital Internship 311	Rehab 328	(summer)		12 wks.
Third Year:					
Applied Anatomy	Applied Anatomy 401	Rehab 416	(0-1)	(0-1)	26
*Clinical Neuro-physiology	Clin. Neuro 400	Rehab 445	(2-0)	(2-0)	52
*Clinical Therapeutics	Clin. Ther. 400	Rehab 450	(2-0)	(2-0)	52
Hospital Internship	O.T. Clinical Practice	Rehab 426	(0-9)	(0-11)	260
Occupational Therapy	O.T. 400	Rehab 405	(3-0)	(4-0)	91
Occupational Therapy	O.T. 401	Rehab 406	(0-9)	(0-10)	247
Psychiatry	Psychiatry 400	Rehab 435	(4-0)	(0-0)	52
Speech Therapy	Speech Therapy 400	Rehab 456	(1-0)	(0-1)	26

*Denotes courses common to all students.

CALENDAR COURSE DETAILS—OCCUPATIONAL THERAPY

***Anat 200** (3-5; 3-5)

Lectures and demonstrations including dissection covering the microscopic and gross structures of the human body, with emphasis upon the skeletal, muscular and nervous systems.

***Biol 230** (3-3; 3-3)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This course is prerequisite to most senior biology courses.

Prerequisite: Biology 30 or Biology 130.

***Engl 210** (3-0; 3-0)

A course designed to increase appreciation of good literature and afford practice in setting down ideas in good English.

Rehab 205 (0-0; 2-6)

A lecture-laboratory series to include the history and development of Occupational Therapy and its present day role in Rehabilitation. Instruction in some basic Therapeutic Activities used in the physical and psychiatric fields.

Textbook: Dept. of the U.S. Army Tech. Manual *Occupational Therapy.*

P Ed 226 (0-2; 0-2)

This course will include rhythmics, active games and dancing suitable for all age groups. It will include swimming and water safety techniques.

***Psyco 212** (3-0; 3-0)

A survey of problems, methods and principles in several fields of Psychology, with particular emphasis on child, adolescent and adult development and behaviour.

***Rehab 210** (1-5; 0-0)

An introduction to the basic principles of Physical and Occupational Therapy, including field trips to Industrial and Rehabilitation Units in the city. An elementary course in First Aid will be presented by a member of the St. John's Ambulance Corps.

Second Year

Rehab 316 (0-2; 0-2)

Laboratory sessions and demonstrations, with prosected specimens, including a more detailed study of the Nervous System and Functional Anatomy as related to Occupational Therapy.

Rehab 326 (0-9; 0-9)

Clinical Practice—An introduction to the practical application of Occupational Therapy techniques on patients suffering from various physical and psychological diseases, in various local approved institutions.

***Rehab 330** (2-0; 2-0)

Medicine and Surgery—A series of lectures on the common diseases met within the Rehabilitation Department, to include:

(a) *Gross Pathology*: Inflammation, repair, degenaration and surgical and medical pathology.

(b) *Medical Conditions*: The Arthritides, Cardio-vascular and other medical conditions.

(c) *Orthopaedic Problems*: Traumatic conditions in bone, joint and muscle; diseases of the skeletal system, etc.

(d) *General Surgical Conditions*

Rehab 305 (2-6; 2-4)

A continuation of Rehabilitation Medicine 205 with the introduction of further training in therapeutic activities as applied in the treatment of psychiatric illness and physical disabilities. Special emphasis will be placed on the training of patients in mastering Activities of Daily Living in keeping with their disability. A short series of lectures and practical work will be presented by the School of Household Economics. A series of lectures will be given in Administration and the theory of Occupational Therapy.

A two-week Introductory and Revision Course will be given preceding the session.

Textbook: Willard and Spackman, *Principles of Occupational Therapy.*

***Physl 261** (3-3; 3-3)

The lecture course comprises the essentials of human physiology. The laboratory course provides experience in handling living tissues and in certain basic physiological techniques.

Textbooks: Tuttle and Schottelius, *Text Book of Physiology.*

Reference: Bell, Davidson and Scarborough, *Textbook of Physiology and Biochemistry,* 5th ed.

Prerequisites: Biology 30 or Biology 130 or 230; Anatomy 200.

***Rehab 335** (1-0; 1-0)

An orientation towards the understanding of personality, its development and function. A discussion of personality types in health and disease, including reference to group dynamics.

Textbook: *Introduction to Psychiatry* by Max Valentine (Livingstone).

Soc 202 (3-0; 3-0)

Introductory Sociology—An introductory analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society is analysed in terms of its structure, culture and social ranking schemes. The interrelationships between the various institutions (e.g. family, church, school, government) are considered. The processes are examined whereby the individual is socialized into society, as are the sources of conformist and non-conformist behavior.

Rehab 328 (12 weeks)

A period of twelve weeks will be spent in approved hospitals and institutions in the Province of Alberta. During this time the students will undertake practical experience in Occupational Therapy Departments.

Third Year

Rehab 416 (0-1; 0-1)

A practical course in the study and evaluation of anatomical movement in relation to functional activities.

***Rehab 445** (2-0; 2-0)

Clinical Neuro-Physiology—An introduction and appreciation of the neurophysiology and gross pathology of some of the common disease conditions referred to the Physical Medicine Department for treatment. This lecture series will be supplemented by clinical patients and visual aids. Some of the disease conditions covered are: Hemiplegia, Parkinson's Disease, Multiple Sclerosis, Amyotrophic Lateral Sclerosis, Syringomyelia, Anterior Poliomyelitis, Neuritides, Peripheral Nerve Injuries, Herpes Zoster, Neurasthenia, Hysterical manifestations, Paraplegia and Quadriplegia.

***Rehab 450** (2-0; 2-0)

The medical application of physical principles and rehabilitation techniques for disabled people, demonstrated clinically with patients and assisted by Hospital and Clinic Staff.

Rehab 405 (3-0; 4-0)

A presentation in tutorials and lectures of the purpose and function of the profession. The principles of teaching, work adjustment and evaluation, programming, management in the home for the disabled homemaker, and the principles of time and motion study will be emphasized.

Textbook: Macdonald, *Occupational Therapy in Rehabilitation* (Bailliere, Tindall and Cox).

Rehab 426 (0-9; 0-11)

Clinical Practice—Third year students will attend supervised clinics at the University Hospital and other approved institutions, and continue their practical training under the supervision of qualified Occupational Therapists.

Rehab 406 (0-9; 0-10)

Practical laboratory experience in Therapeutic Occupations for every type of patient. Recreational activities. Job-sampling techniques applied to prevocational evaluation.

Rehab 435 (4-0; 0-0)

A discussion of factors influencing personality function—factors both detrimental and beneficial, leading to a discussion of personality disorders, their diagnosis, classification and treatment, with special reference to the role of the Occupational Therapist. Case studies will be made.

Rehab 456 (1-0; 0-1)

A series of lectures and demonstrations which will include an introduction and orientation of Speech Therapy in the retraining of the disabled suffering from dysarthria, defective speech and aphasia.

PHYSICAL THERAPY PROGRAM

Subject	Course Number Old	New	Hrs. Per Week 1st Term	2nd Term	Total
First Year:					
*Anatomy	Anatomy 200	Anat 200	(3-5)	(3-5)	208
*Biology	Biology 230	Biol 230	(3-3)	(3-3)	156
*English	English 210	Engl 210	(3-0)	(3-0)	78
Physical Therapy	Physical Therapy 200	Rehab 240	(0-0)	(2-6)	104
*Physical Education	Phys. Ed. 226	P Ed 226	(0-2)	(0-2)	52
*Psychology	Psychology 212	Psyco 212	(3-0)	(3-0)	78
*Rehabilitation	Rehabilitation 200	Rehab 210	(1-5)	(0-0)	78
Second Year:					
Applied Anatomy	Applied Anatomy 300	Rehab 315	(0-2)	(0-2)	52
Electrotherapy	Electrotherapy 300	Rehab 320	(2-4)	(1-2)	117
Hospital Internship	P.T. Clinical Practice	Rehab 325	(0-9)	(0-9)	234
*Medicine & Surgery	Medicine & Surgery 300	Rehab 330	(2-0)	(2-0)	52
*Physiology	Physiology 261	Physl 261	(3-3)	(3-3)	156
*Psychiatry	Psychiatry 300	Rehab 335	(1-0)	(1-0)	26
Remedial Exercises	Remedial Exercises 300	Rehab 340	(3-4)	(3-4)	182
Hospital Internship	Hospital Internship 310	Rehab 327	(summer)		12 wks.
Third Year:					
Applied Anatomy	Applied Anatomy 400	Rehab 415	(0-2)	(0-2)	52
*Clinical Neuro-physiology	Clin. Neuro 400	Rehab 445	(2-0)	(2-0)	52
*Clinical Therapeutics	Clin. Ther. 400	Rehab 420	(1-2)	(0-0)	39
Electrotherapy	Electrotherapy 400	Rehab 420	(1-2)	(0-0)	39
Hospital Internship	P.T. Clinical Practice	Rehab 425	(0-15)	(0-15)	390
Remedial Exercises	Remedial Exercises 400	Rehab 440	(3-3)	(3-5)	182
		new	(4-3)	(3-5)	208
Speech Therapy	Speech Therapy 400	Rehab 455	(1-0)	(0-0)	13

*Denotes courses common to all students.

CALENDAR COURSE DETAILS—PHYSICAL THERAPY

First Year

***Anat 200** (3-5; 3-5)

See description under Occupational Therapy section.

***Biol 230** (3-3; 3-3)

See description under Occupational Therapy section.

***Engl 210** (3-0; 3-0)

See description under Occupational Therapy section.

***P Ed 226** (0-2; 0-2)

See description under Occupational Therapy section.

Rehab 240 (0-0; 2-6)

A series of lectures and laboratory periods will be given in the Theory of Movement, Body Mechanics, and early Re-education following injury or disease. A series of practical classes in the application of Massage techniques will be included.

***Psyco 212** (3-0; 3-0)

See description under Occupational Therapy section.

***Rehab 210** (1-5; 0-0)

See description under Occupational Therapy section.

Second Year

Rehab 315 (0-2; 0-2)

Laboratory sessions and demonstrations, with prosected specimens, including a more detailed study of the Nervous System and Functional Anatomy of the upper extremities and thorax.

Rehab 320 (2-4; 1-2)

During the first three weeks in September, an introductory course is given which includes the basic physical principles of Electricity and Electronics with laboratory practice in simple therapeutic procedures. This is followed by a series of lectures related to the production of Low Frequency currents and their modifications, Short Wave Diathermy, Microwave, and Ultrasonics. Laboratory periods will include practice in the application and indications for their use in Physical Therapy.

Rehab 325 (0-9; 0-9)

Clinical Practice—An introduction to the practical application of Physiotherapy techniques on patients with various physical diseases, in approved institutions.

***Rehab 330** (2-0; 2-0)

See description under Occupational Therapy section.

***Physl 261** (3-3; 3-3)

See description under Occupational Therapy section.

***Rehab 335** (1-0; 1-0)

See description under Occupational Therapy section.

Rehab 340 (3-4; 3-4)

During the first three weeks in September, an introductory course is given which includes Bandaging, basic Nursing Procedures, and patient Ambulation. This is followed by lectures and laboratory periods on the treatment of Arthritic, Orthopaedic, and Neurological Conditions.

Rehab 327 (12 weeks)

During the summer following completion of second year the students will spend 12 weeks as Interns in approved Physiotherapy departments.

Third Year

Rehab 415 (0-2; 0-2)

Laboratory sessions and demonstrations, with prosected specimens, including Functional Anatomy of the Lower Extremities, Trunk, Head and Neck.

***Rehab 445** (2-0; 2-0)

See description under Occupational Therapy section.

***Rehab 450** (2-0; 2-0)

See description under Occupational Therapy section.

Rehab 420 (1-2; 0-0)

Lectures and demonstrations in the production and therapeutic uses of Infra Red and Utlraviolet Radiations. Practical classes will include discussion of the use of Electrotherapy in Medical and Surgical conditions.

Rehab 425 (0-15; 0-15)

Clinical Practice—This will be a continuation of practical experience in approved hospitals and Clinics in the city.

Rehab 440 (4-3; 3-5)

Remedial Exercises—Lecture-demonstrations and practical classes are given in Remedial Exercise Techniques for medical and surgical conditions, from acute illness to full rehabilitation. Special emphasis will be given to advanced Neurology, Respiratory Conditions, Obstetrics and Amputations. This course will include a series of lectures by members of the medical profession, in Obstetrics, in Chest Surgery, and in General Surgery.

Rehab 455 (1-0; 0-0)

A series of lectures forming an introduction to speech therapy.

XXI

The Faculty of Science

OFFICERS OF THE FACULTY OF SCIENCE

Dean—D. M. Ross
Associate Dean—K. B. Newbound
Assistant Dean—R. C. Jacka

Matriculation—Alberta Students

Students from the high schools of Alberta seeking admission to the Faculty of Science must present a high school diploma with "B" or higher standing and an average of at least 60.0% in the following required courses:

1. English 30.
2. Social Studies 30.
*3. Mathematics 30.
†4. French 30 or German 30 or Latin 30 or Ukrainian 30.
5. and 6. *Two* of: Chemistry 30, Physics 30, Biology 30.

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*Mathematics 31 (Trigonometry) with B standing or better will also be required for admission to the honors programs in Mathematics, Physics and Geology and Physics. It is strongly recommended for students intending to concentrate on studies in the Physical Sciences (Chemistry, Geology, Mathematics and Physics) in the general program.

†Ukrainian 30 will only be accepted if a Departmental examination has been passed in this subject. Equivalent standing in certain other languages may be accepted.

Students whose matriculation credits were secured in 1954 or earlier are given full consideration; they are advised to forward to the Registrar complete transcripts of their high school records.

The requirement for a high school diploma may be waived for students of mature age.

These general regulations notwithstanding, the University may, at its discretion, refuse admission to any applicant. For example, this right may be exercised in cases where applicants have written an inordinate number of examinations in order to obtain nominal entrance requirements.

Matriculation—Students from Outside Alberta

Students whose matriculation credits are secured outside Alberta are required to meet standards equivalent to those for Alberta students. They are advised to forward to the Registrar complete transcripts of their high school, or equivalent, records well in advance of the date for registration. A fee of five dollars is charged for evaluating documents originating in Canada and ten dollars if issued in other countries. The University reserves the right to prescribe additional examinations in cases where doubt exists concerning matriculation.

Matriculation Deficiencies

The University offers courses (usually numbered 100) at the Grade XII level for students who are beginning their study of a particular subject. In

certain circumstances, and only with the permission of the Dean, a student may take one such course to remove a matriculation deficiency, in which case it will not count towards a degree.

Promotion Regulations

Since students' fees cover less than one-quarter of the cost to the Province of their University education, the administration is in duty bound to ensure that only those students remain in the University who make effective use of its facilities. For this reason students' records are carefully reviewed from time to time, and those whose standing is unsatisfactory may be obliged to withdraw from the University.

Detailed regulations regarding promotion from one year to another are found in the general regulations for the Honors Programs and the General Program.

Faculty Regulations

Academic regulations governing students in the Faculty of Science are contained in this section and in the general section of the Calendar. However, regulations applicable to particular programs appear in the sections of the Calendar in which these programs are published. In addition, certain courses are subject to individual requirements. Students are advised to read and consider these regulations with great care, and in case of doubt as to the precise meaning of any statement or regulation, to consult the office of the Dean or the Department concerned.

Limitation on Selection of Courses

Students registered in the Faculty of Science normally select courses from those set out in the combined Calendar of the Faculties of Arts and Science. Options from other schools or faculties may be permitted by the Dean.

A student shall restrict his first year registration to junior courses in five different subjects. Senior courses may be taken in the first year only with the consent of the department concerned and the approval of the Dean.

Half-year Courses

A number of courses are offered in one term only; two such courses are recognized as the equivalent of one full course. Where the curriculum requires a full course in a particular subject or division, both courses must be chosen from that subject or division; where the requirement is for an option, any two half-courses may be combined to meet the requirement. Half-year courses are not open to first year students.

PROGRAMS OF STUDY

The Faculty of Science offers honors programs and general programs leading to the degrees of Bachelor of Science (B.Sc.), and Bachelor of Science in Household Economics. The Faculty includes the School of Household Economics.

Honors Programs

The honors programs lead to the B.Sc. degree, with honors in a particular subject or subjects, in four years. They are designed to provide specialization in the chosen subject or subjects together with a longer training than in the

general program, as well as the higher standard implied by the term "honors". An honors program may be interrupted only by special permission of the Council of the Faculty.

Most departments provide a special first year for students who wish to take honors. Permission to take first year honors is granted to students with high matriculation standing and with the approval of the department concerned. A request for this privilege should be made on the Application for Admission or through the head of the department not later than the time of registration. A student who, in his first year, fails to attain the standard necessary for continuance in honors, must transfer to the general program and subsequently must complete all its requirements. The special first year honors programs are so designed that a student can proceed to a degree in the general program without penalty.

A student need not commit himself to honors in his first year, and may register in an appropriate selection of courses as required by the regulations of the general program. If he obtains a sufficiently high standard in his first year and is recommended by the department concerned, he may enter honors in his second year. A student desiring to do so must apply to the Dean, through the head of the department concerned, preferably during his first year and in any case not later than the time of registration for the second year. Consideration will also be given to applications for transfer to honors submitted by students who have completed the second, or even the third, year of the General Program.

Promotion from first year to second year, as well as from second to third and from third to fourth, is by recommendation of the department concerned, for which a Grade Point Average of a least 5.5 is required. A student who is not recommended to continue in honors at the end of his second year will be transferred to the general program, and must select his courses accordingly.

A student who is not recommended to continue in honors at the end of his third year, or who fails to complete the requirements for a degree with honors in his fourth year, may be granted the general degree forthwith, provided that the courses he has taken and the standing attained are satisfactory. Otherwise he may be required to take one or more additional courses in a subsequent summer or winter session. A student who, for any reason, is unable to return to university for the fourth year may apply for a general degree under the same conditions.

In all years a student's program must be approved by his department and by the Dean, and is subject to the following general provisions:

1. A student is not permitted to confine his studies to one discipline; during his first three years he must take at least three courses not closely related to his subject of specialization. For example, a student specializing in Natural Science, must take at least three Arts courses.
2. In the third and fourth years considerable latitude is permitted in order to meet the needs of individual students. A student may choose to concentrate closely on one subject or to widen his field of study. In the latter case he will not be required to take, over the four years, more than ten courses in the subject of concentration.

3. German 210 or Russian 210 is permitted for credit as an approved option in any year.
4. The term "option", where it appears in the programs, is to be construed as a course freely chosen by the student provided he has necessary prerequisites. An "approved option" is to be construed as an option approved by the department directing the program of the student concerned.

Degrees with honors are awarded in two classes, first class honors and honors. For first class honors a grade point average of 7.5 (formerly 80%) is required; for honors 5.5 (formerly 65%).

The prescriptions for honors programs are listed with the offerings of individual departments.

THE GENERAL PROGRAM

Attention is directed to the regulation in Part I of this Calendar which makes every student responsible for the completeness and accuracy of his registration. This regulation will be strictly enforced.

To be granted the B.Sc. degree, a student must present passing grades (4 or better) in a minimum of fourteen full courses, not less than 3 in a fifteenth full course, and a Grade Point Average of at least 5.0 (formerly an average of 60%) in all courses credited towards the degree after the first year. Students transferring to this University with advanced standing will be required to complete at least five of the fifteen courses at the University of Alberta.

The normal program is set out below, i.e. five full courses per year for three years. The Dean may, in exceptional circumstances, permit a student to proceed to a degree over a longer period, or to meet the requirements in a shorter time by attendance at summer session and by taking extra courses during the regular session.

A student will not be allowed to write more than five supplemental examinations for the purpose of obtaining passing marks or of raising his Grade Point Average to the required 5.0. A student may not write more than two supplemental examinations in any year.

A student who is repeating a year will be granted no supplemental privileges in the courses taken that year, and must pass all courses with a Grade Point Average of 5.0 to be allowed to continue in the Faculty of Science. The privilege of repeating a year will be granted to a student not more than once during his candidacy for a degree in this Faculty, unless by special permission of the Dean.

Requirements for the B.Sc. in the General Program

First Year

English 200 or 210; an Arts course; a Science course; two options; Physical Education.

Second Year

An Arts course; a Science course; three options.

Third Year

An Arts course; a Science course; three options.

NOTES: 1. Each student must include in his program a minimum of three courses and a maximum of five in a principal subject of concentration, and a minimum of three and a maximum of four in a second subject of concentration.

2. There may not be more than seven junior courses in the program, except by special permission of the Dean.

3. A student registering for the B.Sc. degree must choose his principal subject of concentration in the physical or biological sciences. To be awarded the B.Sc., the student must pass at least eight science courses. Not more than eleven science courses may be credited towards the degree.

4. Students should study the Advice to General Program Students, which appears under the departmental headings on subsequent pages of this Calendar, and should consult members of the departments offering the courses they choose.

Requirements for B.Sc. after B.Ed.

Holders of the B.Ed. degree, whose programs include thirteen Arts and Science courses, may qualify for the B.Sc. degree by completing a six-course program and attaining a Grade Point Average of 5.0 in these courses, as prescribed by the Faculty of Science. Those with fewer than thirteen Arts and Science courses will be required to take additional courses.

Requirements for B.Sc. after B.A.

Students who have qualified for the degree of B.A. may proceed to the degree of B.Sc. by completing a 9-course program as prescribed by the Faculty of Science and attaining a Grade Point Average of 5.0 in these courses.

Pre-Professional Requirements—Faculties of Dentistry and Medicine

Admission to the Faculty of Dentistry or the Faculty of Medicine is contingent upon the successful completion of two years of University study and the presentation of full university courses in organic chemistry, inorganic chemistry, physics and zoology. Students who register in the Faculty of Science in order to meet these requirements should include in their programs Chemistry 230, and 350, Physics 100, or 200 or 240 and Biology 230 or equivalent. If Physics 240 is taken, it should be followed by Physics 340.

Classification of Courses

Courses offered in the Faculties of Arts and Science are classified as follows:

Humanities

Art
Classics 240, 350, 351, and 354
Comparative Literature
Drama
English
French
German
Greek
Hebrew (St. Stephen's College)
Household Economics 350
Italian
Latin
Linguistics
Music
Old and New Testament Literature
Polish
Russian
Scandinavian
Spanish
Ukrainian

Social Sciences

Anthropology (excluding 390)
Classics 352, 353, 356, 358 and 395
Christian Apologetics 366 (St. Joseph's College)
Economics
Education
Geography—Courses as listed in the Calendar of the Faculty of Arts.
History
Philosophy
Political Science
Psychology—Courses as listed in the Calendar of the Faculty of Arts.
Sociology (excluding 311)

Natural Sciences

Anthropology 390
Astronomy
Bacteriology
Biochemistry
Biology
Botany
Chemistry
Computing Science
Entomology
Genetics
Geography—Courses as listed in the Calendar of the Faculty of Science.
Geology
Mathematics
Microbiology
Physical Science
Physics
Physiology
Plant Biochemistry and Physiology
Psychology—Courses as listed in the Calendar of the Faculty of Science.
Sociology 311
Soil Science 240 and 250
Statistics
Zoology

DETAILS OF COURSES

NOTES: 1. Instructors are listed by departments. The rank in each case is that held in January 1966.

2. The hours of instruction for both terms of the winter session are shown at the top of each course description. The letter "L" attached to a figure signifies lecture-laboratory-hours, and the letter "s" seminar-hours. The symbol 3/2 means three hours in alternate weeks. Unless otherwise specified, the first figure in each term indicates lecture-hours and the second laboratory-hours.

3. Courses numbered 100 to 299 inclusive, described as junior, are open to first-year students and, in some circumstances, are also available as options in senior years. Courses numbered 300 to 499 described as senior, are primarily for students beyond the first year at University. Those numbered 500 or higher are open to honors and graduate students. For further information, particularly in the matter of prerequisites, students are advised to consult the section of the calendar containing detailed descriptions of courses.

The University reserves the right to modify or withdraw for the session any of the courses here outlined.

Courses From Other Faculties

The following course listing includes a few courses offered by other faculties which are frequently taken by students in the Faculties of Arts and Science. Students are advised to consult other calendars, particularly those of the Faculties of Agriculture, Commerce, Education and Medicine for information about courses offered by those faculties which may be acceptable in and/or complementary to the programs of students in Arts or Science who have special interests.

ANTHROPOLOGY

Anthro 390. (3-3; 3-3)

Instruction offered by members of the Department of Sociology and Anthropology.

Physical Anthropology—A study of human origins, evolution and variation; primates, fossil man, races of *Homo sapiens*. Anthropometric and genetic approaches to the analysis of human differences.

Prerequisite: A course in Biology or Zoology, or consent of department.

ASTRONOMY

Instruction offered by members of the Departments of Mathematics and Physics.

Astro 253. (3-0; 3-0)

Astronomy—Naked-eye astronomy. Astronomical coordinates. Telescopes. Sidereal and solar time. The earth-moon system. Eclipses. The solar system. Physics of the Sun. Stellar magnitudes and spectra. Variable stars. Binary stars and clusters. Our galaxy. Exterior galaxies and quasars. Cosmology.

Prerequisite: Mathematics 30. Some knowledge of trigonometry and logarithms is required, and students are advised to have credit in Mathematics 31 or equivalent.

Astro 410. (3-0; 3-0)

Astrophysics—Stellar spectra and their interpretation, deduction of the characteristics and constitution of stars, cosmological theories, spectroscopy of the planets and theories of the solar system, terrestrial magnetism, structure of the earth, radio-astronomy and other modern advances.

Prerequisites: Physics 240 and Mathematics 201 or 207.

BIOCHEMISTRY

Instruction offered by members of the Department of Biochemistry in the Faculty of Medicine.

Honors in Biochemistry

In the Honors program in Biochemistry opportunity will be given, in the choice of options, for concentration in various areas of Biochemistry.

First Year

Chemistry 230, Chemistry 250, Mathematics 201, Biology 130 or 230, English 200 or 210, Physical Education.

Second Year

Biochemistry 300, Chemistry 370, Physics 200 or 240, Mathematics 304, an Arts option (German 210 or Russian 210 recommended).

Third Year

Two senior half courses in Biochemistry, Chemistry 312, Physiology 361 or Botany 320, Physics 340 or 400, an Arts option.

Fourth Year

Biochemistry 501, two senior half courses in Biochemistry, Chemistry 450, two approved options.

Students wishing to major in Plant Biochemistry must take Botany 320 in the third year, and elect Plant Biochemistry in the third and/or fourth years. Recommended options for fourth year include: Chemistry 553, 555, 559, 572, 585; Biometrics 454, Genetics 351, Microbiology 360.

Students are advised to have a reading knowledge of French, German or Russian. Attendance at the departmental seminars is required in fourth year. Students may be required to take a comprehensive oral examination at the end of the fourth year.

Bioch 300. (3-3; 3-3)

General Course—Structure and chemistry of the cell; acidimetry and alkalimetry; chemistry of carbohydrates; lipids, proteins and nucleic acids; enzymes; bioenergetics; digestion, absorption and intermediary metabolism of carbohydrates, lipids, proteins, and nucleic acids; mineral metabolism; vitamins; blood chemistry; chemistry of respiration.

Prerequisites: Chemistry 230, Chemistry 250.

Honor and Graduate Courses—

Bioch 501. (0-3; 0-3)

Advanced Laboratory—A laboratory course to accompany the graduate lecture courses offered to fourth year Honors and to graduate students. The em-

phasis will be on standard methods and techniques as applied to biochemical research. The actual course content may depend upon the lecture courses selected and the interests of the students.

Available to fourth year Honors Biochemistry students only.

Bioch 511. (3-0; 0-0)

Enzymology — The properties of enzymes and cofactors; the chemistry, mechanisms and kinetics of selected enzymic reactions; the principles of multi-enzyme systems.

Prerequisites: Biochemistry 300 or Plant Physiology and Biochemistry 431 and 432, Chemistry 370, or 372.

Bioch 521. (0-0; 3-0)

Nucleic Acids—A consideration of the nucleic acids from the points of view of chemistry, structure and function. Specific topics will include the following: classes of nucleic acids and their distribution in cells; basic composition of nucleic acids and the structural chemistry of their constituents; isolation and physicochemical characterization of the nucleic acids; pathways of bio-synthesis of the nucleic acids; biological functions of the nucleic acids with emphasis on the role of the ribonucleic acids in protein biosynthesis.

Prerequisites: Biochemistry 300 or Plant Physiology and Biochemistry 431 and 432. It is recommended that Biochemistry 531 (Chemistry of Proteins) be taken prior to or concurrently with this course.

Bioch 531. (3-0; 0-0)

Chemistry of Proteins—A lecture course on topics in protein chemistry, including the following: isolation and solubility; electrochemical properties; size, shape and hydration; methods for establishment of primary, secondary and tertiary structure; relation of structure to function as exemplified by special protein systems.

Prerequisites: Biochemistry 300 or Plant Physiology and Biochemistry 431 and 432, Chemistry 370 or 372.

Bioch 541. (0-0; 3-0)

Nucleotide Metabolism—The soluble nucleotides of animals and bacterial cells will be discussed from these viewpoints: chemical properties; synthetic and analytical methods; biosynthesis of purine and pyrimidine ribo- and deoxyribonucleotides; relationships to other areas of intermediary metabolism; catabolism; control mechanisms in nucleotide metabolism; carcinostatic antimetabolites. Emphasis will be placed on current problems and on the recent literature.

Prerequisites: Biochemistry 300 or Plant Physiology and Biochemistry 431 and 432.

Bioch 561. (0-0; 3-0)

Chemistry of the Erythrocyte—A lecture course on recent advances in the chemistry of mammalian erythrocytes, to include: structure and composition; the hemoglobins; metabolism and biochemical lesions; permeability and cation transport; the life span; blood storage.

Prerequisites: Biochemistry 300 or Plant Physiology and Biochemistry 431 and 432.

Bioch 571. (2-0; 2-0)

Recent Advances—A seminar course on topics of current interest in Biochemistry, with reading of original literature.

Available to Graduate students in Biochemistry only.

N.B.—Not all graduate courses are offered every year.

Students wishing to proceed to the degree of M.Sc. or Ph.D. in Biochemistry should consult the Head of the Department with regard to requirements and research facilities.

BIOLOGY

Instruction offered by members of the Departments of Botany, Entomology, Genetics and Zoology.

Advice to General Program Students

Students who choose biology as a subject of concentration are advised to consult the members of the Permanent Committee on the Biological Sciences most appropriate to their interests; this committee is represented in the Departments of Botany, Entomology, Genetics and Zoology.

Biol 130. (3-3; 3-3)

Introductory Biology—An introduction to Biology, with emphasis on principles. Not open to students with credit in Biology 30.

Biol 230. (3-3; 3-3)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This course is prerequisite to most senior biology courses.

Prerequisite: Biology 30 or Biology 130.

Biol 231. (3-3; 0-0)or(0-0; 3-3)

Plant Form and Function—Comparative morphology and physiology of plants at an intermediate level.

(Open only to students beyond their first year, who have an elementary University zoology course, and require some equivalent botany.)

Biol 232. (3-3; 0-0)or(0-0; 3-3)

Comparative Zoology—Animal morphology, physiology and development at an intermediate level.

(Open only to students beyond their first year, who have an elementary University botany course, and require some equivalent zoology.)

Biol 451. (3-0; 3-0)

History and Philosophy of Biology—An account of selected periods of biological discovery in relation to historical and cultural developments; an examination of the important ideas which have arisen from, or which have influenced biology. Intended especially for honors students in biological subjects but open to other students with necessary prerequisites.

Prerequisite: Biology 230.

Biol 584. (3-0; 0-0)

Biological Ultrastructure—Structure of animal and plant tissues, bacteria and viruses as revealed by the electron microscope.

Pre- or corequisites: Zoology 481 or Botany 507 or Microbiology 402, or consent of departments.

Biol 585. (0-0; 3-3)

Electron Microscopy—Theory and practice of electron microscopy; preparation procedures.

Prerequisite: Consent of departments.

BOTANY

Professors—H. J. Brodie, R. G. H. Cormack, Lorene L. Kennedy, W. N. Stewart, J. H. Whyte.
Associate Professors—E. A. Cossins, J. G. Packer.
Assistant Professors—G. H. LaRoi, B. S. Young.
Lecturer—Janette Goodwin.

Honors in Botany

Students intending to enter the Honors program in Botany should consult the Department for advice about the details. The Honors program provides a comprehensive training in Botany and is the most desirable route for students intending to proceed to higher degrees and a research or academic career.

A minimum of eight courses in Botany must be taken in the Honors program. Certain ancillary subjects are required and certain others are recommended as options. Students are normally required to take courses in the following subject areas: (1) Introductory Botany; (2) Plant Anatomy; (3) Plant Physiology; (4) Plant Taxonomy; (5) Plant Ecology. Certain of the above subjects are covered by more than one of the senior courses. Some half-year courses may be combined to constitute a full-year course in the areas mentioned (3, 4 and 5 above).

Attendance at the weekly one-hour seminar, Botany 420, is required in the third and fourth years.

Students are required to make themselves acquainted with Canadian plants by collecting and reading during the summer months.

First Year

English 200 or 210; Chemistry 130 or 230; Geology 201; an approved option*; Biology 130 or Biology 230**; Physical Education.

Second Year

Two senior courses in Botany; Chemistry 350; a Science option; an Arts option.

Third and Fourth Years

Five senior courses in Botany, which must include Botany 400 and Botany 503; four approved options; one open option.

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*Students without Physics of matriculation should take Physics 100.

**Students lacking Biology 30 are required to take Biology 130; students who have taken Biology 30 may proceed to more advanced courses with the consent of the Department.

Advice to General Program Students

Students intending to pursue botany as far as the General Program Curriculum allows are advised to include in their program, *five* full-year courses dealing with the following subject areas: (1) Introductory Botany; (2) Plant Anatomy; (3) Plant Physiology; (4) Plant Taxonomy; (5) Plant Ecology.

Certain of the above subjects are covered by more than one of the senior courses. Some half-year courses may be combined to constitute a full-year course in items 3, 4, 5 above.

It should be noted that not every half-year course is offered in any particular year.

Junior Course—

See Biology 130 and Biology 230.

Senior Courses—

Bot 300. (3-3; 3-3)

Flowering Plants—The origin and evolution of flowering plants; their morphology and classification; species concepts; plants in relation to their environment; principles of nomenclature.

Prerequisite: Biology 230 or consent of department.

Bot 301. (2-4; 0-0)

Flora of Alberta I—A survey of the non-vascular plants of Alberta with emphasis on identification.

Prerequisite: Biology 230 or consent of department.

Bot 302. (0-0; 2-4)

Flora of Alberta II—A survey of the vascular plants of Alberta with emphasis on identification.

Prerequisite: Biology 230 or consent of department.

Bot 310. (3-3; 3-3)

Plant Anatomy and Histology—A course in the structure and development of organs and tissues of the higher plants. Emphasis is placed on the experimental approach to anatomical studies and on the environmental and physiological control of development and morphology.

Prerequisite: Biology 230 or consent of department.

Bot 320. (3-3; 3-3)

Introductory Plant Physiology—A general introductory course in plant physiology including coverage of recent advances in water relations, permeability, active uptake of salts, enzymes, respiration, photosynthesis, intermediary metabolism, nitrogen assimilation and translocation.

Prerequisites or corequisites: Biology 230, Chemistry 230, Chemistry 250 or 350, or consent of department.

Bot 321. (3-0; 0-0)

Plant Geography—A study of the earth's main vegetational types and the significance of their present day distribution. Normally to be taken in sequ-

ence with Zoology 321. Open to students in the third year of Botany and Zoology programs and to students in the Geography programs.

Prerequisites: Biology 230 and Geography 201 or consent of department.

Bot 331. (3-3; 0-0)

Phycology—The structure, physiology and classification of the algae with special reference to Alberta plants. Consideration is given to the evolution of these plants and their role in nature.

Prerequisite: Biology 230 or consent of department.

Bot 332. (0-0; 3-3)or(3-3; 0-0)

Lichens and Bryophytes—Approximately half the course deals with structure, physiology and classification of the lichens, and half with structure classification and ecology of the bryophytes.

Prerequisite: Biology 230 or consent of department.

Bot 341. (3-3; 0-0)

Mycology—A systematic survey of the fungi with detailed study of representatives of major groups. Emphasis is given to classification, life cycles and distribution.

Prerequisite: Biology 230 or consent of department.

Bot 342. (0-0; 3-3)or(3-3; 0-0)

Physiology of Fungi—Factors affecting growth and reproduction of fungi; beneficial and harmful activities of fungi.

Prerequisite: Biology 230 and Botany 341 or consent of department.

Bot 351. (3-3; 0-0)or(0-0; 3-3)

Seedless Vascular Plants—The structure, reproduction and classification of the seedless vascular plants with emphasis on their evolution and their place in the history of terrestrial vegetation.

Prerequisite: Biology 230.

Prerequisite or corequisite: Botany 310.

Bot 352. (0-0; 3-3)or(3-3; 0-0)

The Gymnosperms — The structure and evolution of the Gymnospermae; taxonomy and geographic distribution of living gymnosperms.

Prerequisite: Biology 230.

Prerequisite or corequisite: Botany 310.

Bot 360. (3-3; 3-3)

Palaeobotany—Systematic study of fossil plants.

Prerequisite: Botany 310; Geology 201.

Bot 400. (6L; 6L)

Special Problems—Assigned reading and laboratory research projects in a field selected from: plant anatomy, biochemistry, ecology, mycology, phycology, physiology, taxonomy.

Prerequisites: Biology 230 and one senior course in Botany.

Bot 401. (0-6L)or(6L-0)

Special Problems—A one-term course corresponding to Botany 400. Assigned reading and laboratory research projects in a field selected from: plant anatomy, biochemistry, ecology, mycology, phycology, physiology, taxonomy.

Prerequisites: Biology 230 and one senior course in Botany.

Bot 420. (1s-0; 1s-0)

Seminar in Botany — Participation required of all Senior and Graduate Students.

Bot 422. (3-4; 0-0)

Plant Ecology—Ecological principles and relationships at the organism, population and community levels. Emphasis on the plant and the ecosystem. Laboratory will consist of field trips and greenhouse-growth chamber experiments.

Prerequisite: Biology 230, Botany 300 or 301 and 302 or consent of department.

Bot 450. (3-3; 0-0)

Intermediate Plant Physiology I—The physiology of growth dormancy and seed germination. The translocation of organic material in plants.

Prerequisite or Corequisite: Botany 320 or consent of department.

Bot 451. (3-3; 0-0)or(0-0; 3-3)

Intermediate Plant Physiology II—The plant in relation to water, drought resistance, winter hardiness, mineral nutrition.

Prerequisite or Corequisite: Botany 320 or consent of department.

Honors and Graduate Courses—

Bot 503.

Field Course in Botany—A two-week field survey of the terrestrial and aquatic flora and vegetation of Alberta and adjacent regions. Course offered in late summer immediately prior to registration week. Alternate years. Required for the Honours B.Sc. in Botany and should be taken in either the third or fourth year.

Bot 504. (6L; 6L)

Advanced Mycology—Reading and review of current literature with experimental study of a selected problem. Credit according to work done up to a maximum of 6 hours.

Prerequisite: Botany 341 and 342 or consent of department.

Bot 506. (6L; 6L)

Advanced Taxonomy — Speciation and species problems in the flowering plants; cytotaxonomy and the use of the experimental methods in taxonomy.

Prerequisite: Botany 300 or consent of department.

Bot 507. (6L; 6L)

Advanced Plant Anatomy and Histology — Modern methods of preparing plant material for microscopic examination, with practice in fixing, embedding, cutting and staining.

Prerequisite: Botany 310 or consent of department.

Bot 508. (0-0; 3-3)

Vegetation Analysis—The description and classification of plant communities. Sampling methods and treating of data.

Prerequisites: Botany 422, Statistics 255 or Biometrics 455, or consent of department.

Bot 509. (0-0; 3-3)or(3-3; 0-0)

Pollen and Spore Morphology—A laboratory-conference course dealing with pollen and spore morphology; techniques of study; applications of information provided by study of these structures.

Prerequisite: Consent of department.

Bot 510. (3-4; 0-0)

Environment Analysis—The theory and description of environment and organism habitat relationships. Methods of measurement, treatment of data, correlation and causation. Laboratory will consist of field observations and demonstration of instrumentation.

Prerequisites: Botany 422 or Zoology 462, or consent of department.

Bot 511. (0-0; 3-0)

Advanced Plant Ecology—Development of ecological concepts and principles, especially those relating to the theory and classification of vegetation. Seminar discussion of several schools of ecological thought.

Prerequisites: Botany 422 or equivalent, or consent of department.

Bot 521. (0-0; 3-0)

Plant Geography II—A study of plant distribution patterns and the theories advanced to explain them.

Prerequisite: Botany 321.

Prerequisite or corequisite: Botany 300.

Bot 531 (6L; 6L)

Advanced Phycology—Investigation of special problems in the study of Algae involving laboratory projects and reading of current literature. Credit according to work done up to a maximum of 6 hours.

Prerequisites: Botany 331, or consent of Department.

Plant Physiology and Biochemistry

Pl Ph 551. (3-0; 0-0)or(0-0; 3-0)

Advanced Plant Biochemistry—Selected topics in plant metabolism, with emphasis on the comparative biochemistry of respiration and carbon assimilation. Evaluation of recent research and methods of investigation in these fields.

Prerequisites: Biochemistry 300, or Plant Physiology and Biochemistry 431 and 432 or consent of Departments.

CHEMISTRY

Professors—H. E. Gunning (Head), R. K. Brown, G. R. Freeman, D. Hall, W. E. Harris, R. U. Lemieux, R. B. Sandin.

Associate Professors—W. F. Allen, W. A. Ayer, F. W. Birss, R. J. Crawford, D. Darwish, S. G. Davis (Secretary), H. B. Dunford, S. Fraga, W. A. G. Graham, P. Kebarle, S. Masamune, R. N. O'Brien.

Assistant Professors—R. G. Cavell, J. Hooz, R. B. Jordan, A. H. Kalantar, K. R. Kopecky, J. W. Lown, J. S. Martin, S. G. McGeachin, G. J. D. Peddle, J. A. Plambeck, O. Strausz, D. D. Tanner.

Honors in Chemistry

First Year

Chemistry 230, Chemistry 250, Physics 240, Mathematics 201, English 200 or 210, Physical Education.

Second Year

Chemistry 312, Chemistry 372, Physics 340, Mathematics 304, An option (1).

Third Year

Chemistry 511 and 583, Chemistry 550, Chemistry 572, Mathematics 404, an option.

Fourth Year

Chemistry 530, Chemistry 551 and 555, Chemistry 501 and a Chemistry option (2), two options.

As well as the prescribed courses, the program must include:

(i) One non-Chemistry Science course;
(ii) One course in scientific German or Russian (unless advanced credit given);
(iii) One Arts course (not a beginning or scientific language);
(iv) One non-Chemistry option.

In addition to the regular course examinations, candidates for honors may be given one or more oral or written examinations in the field of chemistry at the end of the fourth year.

Attendance at the Departmental Resarch Seminar, Chemistry 602, which meets once a week is required in the fourth year.

NOTES: (1) Any arts or non-chemistry science course, except a beginning or scientific language course. If, however, Chemistry 250 was not taken in the first year, this must be Chemistry 350.
(2) One of Chemistry 553, 559, 561, 589 or 593.
(3) All options shall be selected in consultation with the Department.
(4) Special programs will be set up, following the above as closely as possible, for students transferring from other programs.

Advice to General Program Students

Students choosing chemistry as a subject of concentration should recognize the advisability of including mathematics and physics as ancillary subjects in their programs. The following sequences are recommended:

Three course sequence: Chemistry 230, 350 and one of 312 or 370.

Four course sequence: Chemistry 230, 350, 312 and 370.

Five course sequence: Chemistry 230, 350, 312, 370 and one of 430 or 450.

Students seeking pre-professional and vocational training in chemistry should consult the department.

Students wishing to add a course in Plant Biochemistry should consult the Department of Plant Science, Faculty of Agriculture.

Chem 130. (3-3; 3-3)

Introductory General Chemistry—Lectures: An introduction to chemical principles illustrated by the chemistry of metals, non-metals and of the carbon compounds.

Laboratory: Experiments related to the lecture material.

Chem 230. (3-1s-3; 3-1s-3)

Inorganic Chemistry—Lectures: The fundamental concepts of Chemistry as applied to the elements and their compounds.

Laboratory: The preparation of some compounds; quantitative chemistry.

Prerequisite: Chemistry 130 or Chemistry 30 or equivalent.

Chem 250.* (3-1s**3; 1s**-3)

Organic Chemistry—Lectures: An introduction to a study of the compounds of carbon.

Laboratory: The preparation of some organic compounds.

Textbook: Boyd and Morrison, *Organic Chemistry.*

Prerequisite: Chemistry 130 or Chemistry 30 or equivalent.

Chem 312. (3-6; 3-6)

Quantitative Analysis—Lectures: Principles and methods of quantitative analysis.

Laboratory: Basic analytical methods including volumetric, gravimetric, ion and gas chromatography, potentiometry, radiometric, colorimetric, and simple spectrometric.

Prerequisites: Chemistry 230 or 232.

Chem 350.*** (3-3; 3-3)

Organic Chemistry—Lectures: An introduction to a study of the compounds of carbon.

Laboratory: The preparation of some organic compounds.

Textbook: Boyd and Morrison, *Organic Chemistry.*

Prerequisites: Chemistry 130 or 230 or 232.

Chem 370. (3-3; 3-3)

Elementary Physical Chemistry—Lectures: The laws of thermodynamics; properties of gases, liquids and solids; solutions; equilibrium; phase rule; electrochemistry; colloids; kinetics of reaction.

Laboratory: Physico-chemical measurements.

Textbook: Daniels and Alberty, *Physical Chemistry.*

Prerequisites: Chemistry 230 or 232.

Prerequisite or Corequisite: Mathematics 180 or 201 or 206 or 207 or consent of Department.

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*Students with credit in Chemistry 230 normally will proceed to Chemistry 350, not 250.

**Students not concurrently taking Chemistry 230 are required to take the one hour seminar.

***Students who have obtained credit for Chemistry 250 cannot take Chemistry 350 for credit.

Chem 372. (3-1s-3; 3-1s-3)

Elementary Physical Chemistry—Lectures: Physical chemistry of gases and liquids; the Laws of thermodynamics; physical chemistry of dilute solutions; free energy and chemical equilibrium; the phase rule: electrochemistry.

Laboratory: Physico-chemical measurements.

Prerequisites: Chemistry 230 or 232; Physics 200 or 240.

Prerequisite or corequisite: Mathematics 304.

For honors students only, except by consent of department.

Chem 430. (3-3; 3-3)

Inorganic Chemistry—Underlying principles of the subject followed by a study of the periodic table.

Laboratory: Preparation and study of some less common compounds.

Prerequisite: Chemistry 230.

Prerequisites or corequisites: Chemistry 370 or 372 and 312.

Chem 450. (3-3; 3-3)

Organic Chemistry—Lectures: Continuation of the study of the aromatic and aliphatic compounds. General considerations and mechanisms involved in their reactions.

Textbook: Cram and Hammond, *Organic Chemistry.*

Laboratory: Preparation of some organic compounds.

Prerequisites: Chemistry 230 or 232 and 250 or 350.

Prerequisites or corequisites: Chemistry 370 or 372 and 312.

Chem 501.

Chemical Research—Students in their fourth year of honors will pursue a half course in investigational work under the direction of a member of the department. The equivalent of at least eight hours per week of the second term must be spent on this course.

Chem 503. (3-0; 0-0)

Special Topics in Chemistry (1966)—This will be given by visiting professors.

Chem 511. (3-6; 0-0)

Instrumentation in Chemical Analysis—Lectures: Instrumentation for spectroscopic, electrometric and other methods of chemical analysis

Prerequisite: Chemistry 312; 370 or 372; Physics 340.

Chem 513. (3-3; 0-0)

Electronics for Scientists—An intensive, practical course with emphasis upon basic instrument components, operational amplifiers, digital circuits, and other electronic components of modern research instruments.

Prerequisite: Consent of department.

Chem 530. (3-3; 3-3)

Inorganic Chemistry—Lectures: Bonding, structure and chemical properties of compounds, most of which do not contain carbon.

Text: Cotton and Wilkinson, *Advanced Inorganic Chemistry.*

Laboratory: Preparation and examination of inorganic compounds, illustrating useful experimental techniques.

Prerequisite or corequisite: Chemistry 583.

Chem 550. (3-6; 3-6)

Organic Chemistry—Lectures: A continuation of Chemistry 250 or 350.

Laboratory: Preparation of some compounds; the use of certain equipment such as that used for low-pressure hydrogenation, etc., special techniques such as chromatographic adsorption, etc.

Textbook: Fuson, *Organic Chemistry;* Wiberg, *Laboratory Techniques in Organic Chemistry.*

Prerequisites: Chemistry 250, 350, 312, and 370 or 372.

Chem 551. (2-6; 0-0)

Qualitative Organic Analysis—A study of the characteristic reactions and spectral properties of the various groups of organic compounds and the identification of a number of unknowns from these properties.

Textbooks: Shriner, Fuson and Curtin, *The Systematic Identification of Organic Compounds* (5th edition); Dyer,*Applications of Absorption Spectroscopy of Organic Compounds.*

Prerequisite: Chemistry 450 or 550.

Chem 553. (3-0; 0-0)

Chemistry of Carbohydrates—Lectures: A study of monosaccharides, oligosaccharides and polysaccharides, their properties and derivatives.

Prerequisite or corequisite: Chemistry 450 or 550.

References: Pigman, *The Carbohydrates; Advances in Carbohydrate Chemistry.*

Chem 555. (3-0; 0-0)

Theoretical Organic Chemistry — The applications of current theories to various classifications of reactions are considered. Hammett's correlation of reaction rates, stereochemistry, kinetics, resonance, and factors important to the course of a reaction are discussed.

Textbook: Hine, *Physical Organic Chemistry,* 2nd edition.

Prerequisite: Chemistry 550.

Chem 557. (0-0; 3-0)

Free Radical Reactions in Organic Chemistry

Prerequisite: Chemistry 555.

Chem 559. (0-0; 3-0)

Natural Products—The chemistry of some alkaloids, terpenoids, steroids, and microbial metabolic products; structural determination, possible modes of biogenesis and synthesis of some of these compounds will be discussed.

Prerequisite: Chemistry 550 and 551.

Chem 561. (3-0; 0-0)

Advanced Organic Synthesis—Modern synthetic methods and techniques in the field of organic chemistry with emphasis on recent literature.

Prerequisite: Chemistry 450 or 550.

Chem 572. (3-6; 3-6)

Advanced Physical Chemistry—Lectures: Atomic structure, particles and waves, chemical bonds, molecular structure and spectroscopy, solid and liquid states, chemical kinetics, electrochemistry.

Laboratory: Physical Chemistry measurements.

Texts: Moore, *Physical Chemistry;* Shoemaker and Garland, *Experiments in Physical Chemistry.*

Prerequisite: Chemistry 370 or 372; Mathematics 304.

Chem 573. (0-0; 3-0)

Electrochemistry—A research approach to problems of interest in the field emphasizing the recent literature.

Prerequisites: Chemistry 312, 372.

Chem 583. (0-0; 3-0)

Quantum Chemistry—An elementary course in quantum mechanics with applications to chemical problems.

Prerequisite: Chemistry 370 or 372.

Chem 587. (0-0; 3-0)

Special Topics in Free Radical Chemistry

Chem 589. (3-0; 0-0)

Statistical Mechanics — An introduction to statistical mechanics. Applications to problems of chemical interest will be stressed.

Prerequisite: Chemistry 583 or consent of department.

Chem 591. (3-0; 0-0)

Radiation Chemistry—Brief discussion of radiation sources: interaction of radiation with matter; chemical effects of radiation.

Prerequisite: Chemistry 370 or 372.

Chem 593. (0-0; 3-0)

Molecular Spectroscopy—A study of the spectral characteristics of matter. Emphasis will be on the application of the wide range of data available from studies in various energy regions of the spectrum.

Prerequisite: Chemistry 583.

Chem 595. (3-0; 0-0)

Photochemistry—The fundamentals and significant recent developments in photolytic and photosensitized reactions, including primary process studies.

Chem 597. (3-0;0-0)

Macromolecular Chemistry—The preparation, characterization and physical properties of synthetic organic high polymers and polyelectrolytes. Some discussion of inorganic polymers, nucleic acids, and proteins will be included.

Prerequisite: Chemistry 572 or consent of department.

Chem 599. (3-0; 0-0)

Chemical Applications of Mass Spectrometry—Application of mass spectrometric measurements to problems in chemistry—gas and solid analysis, problems in reaction kinetics, organic structural analysis.

Chem 602. (2s-0; 2s-0)

Departmental Research Seminar—Reports on studies of the literature or of current research in the Department. Required each year of all graduate students in the Department of Chemistry and the fourth year honors students.

Chem 604. (2s-0; 2s-0)

Advanced Research Seminar—Reports on topics related to the fields of specialization of the graduate student. These seminars will be set up by the various members of staff as required.

Chem 613. (3-0; 0-0)

Electroanalytical Chemistry and Polarography

Chem 615. (3-0; 0-0)

Advanced Analytical Chemistry

Chem 617. (0-0; 3-0)

Analytical Spectroscopy

Chem 633. (0-0; 3-0)

Selected Topics in Advanced Inorganic Chemistry—A study of selected topics including organometallic compounds, hydrides and metal carbonyls.

Prerequisite: Chemistry 530 or 631 and 635 or consent of department.

Chem 637. (0-0; 3-0)

Topics in Structural Inorganic Chemistry—Selected topics in advanced inorganic chemistry with particular emphasis on the structural features of the subject.

Prerequisites: Chemistry 530, or consent of the department.

Chem 655. (3-0; 0-0)

Physical Methods of Organic Chemistry—The application of physical methods to structural problems of organic molecules with the emphasis on natural products. The ultraviolet, visible, infrared, nuclear magnetic resonance, electron spin resonance and mass spectroscopy and dissociation constants and optical rotatory dispersion will be discussed.

Prerequisite: Chemistry 551 and 555.

Chem 657. (0-0; 3-0)

Physical Organic Chemistry—A discussion of selected topics in physical organic chemistry. A continuation of topics discussed in Chemistry 555.

Textbook: Hammett, *Physical Organic Chemistry.*

Chem 659. (0-0; 3-0)

Heterocyclic Chemistry—A course in descriptive heterocyclic chemistry which will examine the structures, properties, reactivity, and methods for synthesis of the more interesting heterocyclic systems including those of biological importance. Emphasis will be placed on recent developments in the field.

Prerequisite: Chemistry 655.

Chem 670. (3-0; 3-0)

Advanced Physical Chemistry—Kinetic theory of gases, quantum mechanics, statistical mechanics, chemical kinetics and photo-chemistry.

Prerequisite: Chemistry 372.

Prerequisite or corequisite: Mathematics 404.

Chem 675. (3-0; 0-0)

Magnetic Resonance Spectroscopy—Quantum mechanics of nuclear and electron spins in the magnetic field; analysis and spin-spin coupled NMR spectra; chemical shifts and spin-spin couplings; the Bloch equations; applications of NMR and ESR to chemical problems.

Prerequisite: Chemistry 583 and Mathematics 404.

Chem 677. (3-0; 0-0)

Physical Chemistry—Lectures of the first term of 572.

Chem 679. (0-0; 3-0)

Chemical Kinetics—Lectures of the second term of 572.

Chem 683. (0-0; 3-0)

Quantum Chemistry

Prerequisite: Chemistry 583.

Chem 685. (0-0; 3-0)

Solution Kinetics—The study of chemical reactions in non-polar and polar solvents; Debye-Huckel theory; primary and secondary salt effects; acid-base catalysis.

Textbook: Frost and Pearson, *Kinetics and Mechanisms.*

Prerequisites: Chemistry 372 and one of Chemistry 555 or 575.

COMPUTING SCIENCE

Professors—D. B. Scott (Head), J. J. McNamee.

Associate Professors—S. M. Hunka, R. S. Julius (Assistant Head), K. W. Smillie, E. L. Whitney, K. V. Wilson.

Assistant Professors—W. B. McMinn, S. Charmonman, D. Rankin, M. Razavy, F. Stenger, V. M. Von Maydell.

B.Sc. with Honors in Computing Science

First Year

Mathematics 206 and 271; Statistics 256; approved Science option; Arts option; Physical Education.

Second Year

Computing Science 310; Mathematics 306; Mathematics 325; Science option; Arts option.

The third and fourth years of this program will be offered in the 1967-68 and 1968-69 sessions, respectively.

Advice to General Program Students

Students planning to take Computing Science as a subject of concentration are invited to consult the Department as early as possible regarding the choice of their courses. The following sequence is recommended:

Statistics 256, Computing Science 310 and 460.

Stat 256. (3-0; 3-0)

Probability, Statistics and Numerical Analysis—Probability. Random variables and probability distributions. Binomial, hypergeometric, normal and Poisson distributions. Estimation, tests of hypotheses. Correlation and regression. Inversion of matrices and solution of systems of linear equations. Polynominal interpolation. Divided and ordinary differences, difference operators. Numerical integration and differentiation. Zeros of functions.

Prerequisites or corequisites: Mathematics 206 and 271, or consent of the Department.

Cmput 310. (3-0; 3-0)

Elements of Programming—Logical structure of computers; instructions, algorithms and programs; language of computer programming; conventional computers; assemblers and compilers.

Corequisite: Mathematics 304.

Cmput 456. (0-0; 3-0)

Digital Computer Programming with Statistical Applications—Digital computers and programming languages; principles of program preparation; Fortran IV; applications to statistics and the biological sciences.

Prerequisites: Statistics 255, 305 or 450, Biometrics 455, or consent of the Department.

Cmput 460. (3-0; 3-0)

Numerical Analysis—Matrix methods of linear algebraic equations of moderate order. Determination of eigenvalues and eigenvectors of matrices. Solution of algebraic and transcendental equations. Interpolation, tabulation, and economization. Algebra of operators. Numerical differentiation and integration. Numerical solution of ordinary differential equations and integral equations.

Prerequisites or corequisites: Mathematics 421, 425 or equivalent; Computing Science 310.

Cmput 462. (0-0; 3-0)

Digital Computers and Programming Languages—Principles of program preparation; applications to the behavioral sciences.

Prerequisites: Psychology 309 or Sociology 309 or Statistics 305 or equivalent.

Cmput 540 (3-0; 3-0)

Mathematical Programming—Mathematical background; simplex method of linear programming; duality; degeneracy; game theory; transportation problems; parametric programming; selected topics in nonlinear programming.

Prerequisite: Computing Science 460.

Graduate Courses

Cmput 640. (3-3; 3-3)

Advanced Numerical Analysis—Topics will be selected from problems and procedures of current interest in the field, and will include: Inversion and determination of eigenvalues and eigenvectors for large-order matrices; approximation of functions by orthogonal sets; uniform approximation; numerical integration in n-space; quadrature methods; solution of partial differential equations; stability of step-by-step methods; variational methods; linear and non-linear programming.

Prerequisite: Computing Science 460.

Corequisite or prerequisite: Mathematics 500 or equivalent.

Cmput 641. (3-6; 3-6)

Advanced Automatic Digital Computers and Programming—Topics will be selected from problems of current interest in the field, and will include: Logical design of elementary machines: adders, decoders, control and memory systems. Elementary coding theory (error-correcting codes). Structural organization of general purpose computers; current trends in structural design. Description of sequential processes by algorithmic languages, including numerical (machine) languages and current algebraic languages. Aids to programming: meta-programs, e.g., interpreters, compilers, assemblers, monitors.

Each student will be expected to solve several problems on a computer. Students should have a knowledge of elementary programming before entering this course.

ENTOMOLOGY

Instruction offered by members of the Department of Entomology, Faculty of Agriculture.

Honors in Entomology

The first year program must include the university equivalent of any one of Biology 30, Chemistry 30 and Physics 30 not taken in high school, English 200 or 210, and Physical Education. Other courses required during the program include Chemistry 230 and 250 or 350, Zoology 300 and 350, Botany 301 and 302, Entomology 201, 314, and one or more of 471, 476, 522, 556, and 560, Genetics 351, Biochemistry 300 or Plant Science 431 and 432, an approved language and two other Arts options. Recommended electives include Geology 201 and 305, Micro biology 360, Statistics 255 or Biometrics 455 and senior Botany, Genetics, and Zoology courses. Programs should be decided in consultation with the department.

Advice to General Program Students

Students may become acquainted with the subject by taking Entomology 201; they should have High School Biology 30 or the equivalent at University before doing this. Students contemplating specialization in Entomology should consult the department. A good background in science and especially in biology is a necessary preliminary.

Ent 201. (3-3; 3-3)

General Entomology—Probable origin of insects and related arthropods, their structure and development. Introduction to classification. Their inter-

relationships with other forms of life as a basis to an appreciation of their significance in connection with agriculture and human health.

Textbook: Imms, *Outlines of Entomology.*

Prerequisite: Biology 30, 130, or equivalent.

Ent 302. (0-0; 3-3)

A Survey of Entomology—The lives of insects and some related arthropods from a functional viewpoint, leading into a consideration of their relationships with the physical environment and with other organisms including man.

Prerequisite: Biology 30 or 130 or equivalent.

Prerequisite or Corequisite: Zoology 350.

Ent 314. (2-6; 2-6)

Morphology—A detailed study of the structure of insects from the comparative and functional viewpoints.

Textbook: Snodgrass, *Principles of Insect Morphology.*

Prerequisite: Entomology 201(301) or 302.

Ent 476. (2-4; 2-4)

Insect Toxicology—The chemistry of insecticides and repellents and of accessory materials. Methods of insecticide evaluation. Theories of insecticidal activity.

Textbook: Shepard, *The Chemistry and Action of Insecticides.*

Prerequisite: Chemistry 250 or 350, Entomology 200, 201, or 302 desirable.

Ent 522. (2-6; 2-6)

Taxonomy—Taxonomic principles and procedures. Classification of insects; habits of all important groups. Zoological nomenclature, speciation, phylogeny, zoogeography.

Textbook: Mayr, Linsley, and Usinger, *Methods and Principles of Systematic Zoology.*

Prerequisite or corequisite: Entomology 200, 201, or 302, Entomology 314(414) desirable.

Ent 556. (2-5; 2-5)

Insect Physiology—Life processes illustrated by insects with emphasis on those peculiar to them and their relatives.

Textbook: Wigglesworth, *The Principles of Insect Physiology.*

Prerequisite or corequisite: Entomology 200, 201, or 302, Entomology 314 desirable.

Ent 560. (2-5; 2-5)

Insect Ecology—The relationships of insects to their environment with emphasis on the factors which influence the distribution of insects in time and space. Associations between insects and other organisms. Populations.

Prerequisite: Entomology 201, or 302, or Entomology 200 and 471.

Ent 610.

Advanced Morphology and Histology—A continuing course from Entomology 314, including a detailed study of internal structure. Credit according to work done, up to a maximum of one full course.

Ent 621. (0-6; 0-6)

Advanced Taxonomy—Classification and biology of, and literature on, one or more of the major orders of insects.

Prerequisite: Entomology 522.

Ent 650.

A Project in Insect Physiology—A review and interpretation of the literature on a selected topic with an experimental study of a related problem. Credit according to work done up to a maximum of one full course.

GENETICS

Professors—L. P. V. Johnson, J. Kuspira*, K. A. Lesins, G. W. R. Walker, J. Weijer.
Associate Professor—W. E. Smith*.
Assistant Professors—D. Cameron, D. Nash.
Visiting Professor—J. A. Serra.
Associate Members—P. Bowen, R. Ruth.
*Co-acting Head.

Honors in Genetics

The Honors program in Genetics is designed primarily to prepare students for advanced studies that may lead to higher degrees and to research and academic careers. To some extent the program can be fitted to individual needs. A final comprehensive examination will test the student's general knowledge of facts and principles.

A student choosing the Honors program is requested to meet the Head of the Department of Genetics as early as possible, in order to draw up his course program.

During their senior years it is expected that Honors students will assist as demonstrators in elementary laboratories.

First Year

Biology 130 or 230; Chemistry 230; English 200 or 210; Mathematics 180 or 201; an approved option; Physical Education.

Second Year

Genetics 351; Chemistry 350; Physics 100 or 200; an approved course in Biological Science (Biology 230 if not taken in first year); an Arts option.

Third and Fourth Years

Biochemistry 300; Biology 451; three courses in Genetics; three courses in Biological Sciences; an Arts course; an option.

Genet 351. (3-3; 3-3)

Genetics—Fundamental principles and processes relating to heredity.

Prerequisite: Biology 30 or 130.

Genet 430. (3-0; 0-0)

Microbial Genetics—Detailed analysis of genetic phenomena peculiar to micro-organisms.

Prerequisite: Genetics 351 or equivalent.

Genet 463. (0-0; 3-0)

Genetic Basis of Plant Breeding

Prerequisite: Genetics 351 or 360.

Genet 465. (3-0; 0-0)

Human Genetics—Genetic and cytogenetic aspects of human inheritance.
Prerequisite: Genetics 351 or equivalent.

Genet 481. (3-0; 0-0)

Population Genetics—Gene behavior in populations.
Prerequisite: Genetics 351 or equivalent.

Genet 483. (0-0; 3-0)

Evolutionary Genetics—Population genetics as related to problems in evolution.
Prerequisite: Genetics 481.

Genet 511. (3-3; 0-0)

Cytology—Structural and biochemical organization of cellular organelles; application of analytical techniques.
Prerequisite: Chemistry 250 or 350, and Genetics 351 or equivalent.

Genet 515. (0-0; 3-3)

Cytogenetics—Advanced topics in cytogenetics.
Prerequisite: Genetics 351 or equivalent.
(Not offered in 1966-67)

Genet 517. (3-3; 0-0)

Genetical Statistics—Principles and methods of biometrical analysis applied to specific problems such as quantitative inheritance and linkage.
Prerequisite: Genetics 351 or equivalent.

Genet 520. (0-0; 3-0)

Quantitative Genetics—Gene behavior and genetic analysis in natural and experimental populations.
Prerequisite: Genetics 351 or equivalent.
(Not offered in 1966-67)

Genet 545. (0-0; 3-0)

Biochemical Genetics—Gene action at the molecular and biochemical levels; coding.
Prerequisite: Genetics 351 or equivalent.

Genet 552. (0-0; 3-3)

Radiation Genetics—The biological effects of ionizing and non-ionizing radiation at the cellular level.
Prerequisite: Genetics 351 or equivalent.
(Not offered in 1966-67)

Genet 586. (0-0; 3-0)

Developmental Genetics—Detailed study of gene-controlled processes of development and differentiation.
Prerequisite: Genetics 351 or equivalent.
(Not offered in 1966-67)

Genet 590. (3-0; 0-0)

Classical Contributions in Genetics—An historical approach giving perspective to pre-and post-Mendel advances in genetics.

Prerequisite: Genetics 351 or equivalent.

Genet 601.

Advanced Genetics—A seminar course on advanced and current topics of genetics.

Genet 635. (0-4; 0-4)

Advanced Microbial Genetics—An advanced laboratory course dealing with genetics of fungi, bacteria and bacteriophages.

Prerequisite: Genetics 430.

(Not offered in 1966-67)

Genet 650. (3-0; 0-0)

Genetics of Parasitic Systems—The genetics of host parasite interrelationships.

(Not offered in 1966-67)

GEOGRAPHY

Professor—W. C. Wonders (Head).

Associate Professors—J. F. Bergman, J. J. Klawe, A. H. Laycock, R. W. Longley, P. J. Smith.

Assistant Professors—K. V. Abrahamsson, I. A. Campbell, E. C. Chapman, R. G. Ironside, D. B. Johnson, E. R. Reinelt, N. R. M. Seifried, O. F. G. Sitwell, S. I. Smith.

The Department offers both the B.A. and the B.Sc. degrees with Honors in Geography. Students wishing to stress the humanities and social sciences should register in the B.A. program; those who wish to stress the physical and biological sciences should register in the B.Sc. Program.

B.Sc. with Honors in Geography

First Year

Geography 201; English 200 or 210; Geology 201; one of Biology 130, Biology 230; one of Mathematics 200 or 201, Statistics 255, Physics 240, Chemistry 230; Physical Education.

Second Year

Geography 300; Geography 301; Geography 303; two approved Science options.

Third Year

Geography 400; one of Geography 302, 401, 405, 410, 416 or 418; one approved Arts option; Zoology 321 and Botany 321; one approved Science option.

Fourth Year

Geography 502; an approved second senior Geography course; one approved option in Geology; one approved Science option; one approved option. Students are required to have a reading knowledge of French or German. At the end of the fourth year a candidate for honors will be required to take an oral or written examination in the field of Geography.

Advice to General Program Students

Students interested in Geography as an area of concentration may focus on courses leading to a B.A. or B.Sc. degree. In either case, the following sequences are recommended:

Three course sequence: Geography 201, 300 and one other senior Geography course.

Four course sequence: Geography 201, 300 and two other senior Geography courses.

Five course sequence: Geography 201, 300, 301, a regional course and one other senior Geography course.

Students interested in graduate work in geography should consult the department.

NOTE: Descriptions of Geography 300, 400 and other courses considered as Social Sciences will be found in the Calendar of the Faculty of Arts.

Geog 201. (3-2; 3-2)

Physical Geography—A systematic study of the origin, nature, and distribution of the natural environment. Land forms, weather and climate, vegetation, soils, water, and mineral resources will be related to each other in place. The laboratory work will complement the lectures and will include interpretation, study, and preparation of maps and charts.

Geog 301.

Cartography—History of graphic technology and cartography. Topographic mapping: documentation of data (survey) recording of data (compilation and manuscript) and map reproduction. Reference Grids, Canadian and foreign mapping agencies. Derived maps. Map projections. Geographical atlases. Reproduction methods. Practical work: map reading, cartographic expression and map appreciation.

Geog 303. (3-0; 3-0)

Weather and Climate—A systematic study of weather processes and phenomena, regional weather patterns, climatic classification, and climates of the continents with some consideration of climatic trends. Laboratory assignments will include the interpretation of climatic data, of weather maps, and local weather patterns.

Geog 305. (6L; 6L)

General Cartography—This course is similar to course 301, Cartography,, but is adapted to the needs of students who have not chosen geography as their major field of learning.

Geog 401. (3L-0; 3L-0)

Advanced Physical Geography—A study of climate, vegetation, soil, water and landforms with stress upon local, regional and world patterns of each.

Prerequisite: Geography 201 or consent of the department.

Geog 405.

See Meteorology 405

Geog 409. (6L; 6L)

Advanced Cartography—The emphasis in this course is on problems of map design; compilation of derived and thematic maps and editorial work.

Prerequisite: Geography 301 or Geography 305 or consent of Department.

Geog 418. (3L-0; 3L-0)

Geography of Water Resources—A study of local, regional and world patterns of water supply and demand. Precipitation, evapotranspiration, streamflow, soil moisture, ground water and the management of watershed regions. Domestic, municipal, industrial, irrigation, hydro-power, navigational, fishing, recreational and other demands and the problems of supply, modification and allocation.

Prerequisite: Geography 201 or consent of Department.

Geog 441. (6L; 6L)

Economic and Social Mapping—Map classification. Cartographic methods for qualitative and quantitative mapping. Regional and national atlases. Practical work: graphic representation, reading and appreciation of special maps. Planning of special atlases.

Prerequisite: Geography 301 or consent of Department.

Corequisite: Statistics 255.

Geog 501. (6L; 6L)

Air Photo Interpretation—A study of the physical and cultural geography depicted on vertical and oblique air photos. Interpretation techniques, field use of photos and the elements of photogrammetry.

Prerequisite: A course in Geography or consent of the Department.

Geog 502.

Reading and Seminar Course

Geog 505.

See Meteorology 505

Geog 525.

Field School in Geography—A survey of the geography of a selected region. Field studies for a week in September preceding registration, followed by the preparation of reports on specified topics. Reconnaissance and micro-studies employing geographical field techniques. Required of candidates for the Master's degree in Geography.

Geog 541. (6L; 6L)

Cartographic Design and Editing—Discussion of editorial, planning and management aspects of cartography and of map design.

Prerequisite: Geography 301 or 441 or consent of Department.

Geog 551.

Research in Physical Geography

Geog 553.

Special Problems

Geog 555.

See Meteorology 555

Geog 561. (3L-0; 3L-0)

Water Resources—A regional analysis of water supply and demand patterns and of problems relating to both.

Prerequisite: Consent of Department.

Reason for course—to replace 418 but at a more advanced level with more stress upon student papers and student development of particular topics. A lecture-seminar course with labs and field trips to be arranged.

Geog 631.

Research in Physical Geography

GEOLOGY

Professors—R. E. Folinsbee, H. Baadsgaard, R. A. Burwash, C. R. Stelck.
Associate Professors—H. A. K. Charlesworth, D. E. Jackson, J. F. Lerbekmo.
Assistant Professors—A. J. Broscoe, R. C. Fox, J. A. Westgate.

Honors in Geology

First Year

Geology 201; Physics 240; Mathematics 201; English 200 or 210; an Arts option; Physical Education.

Second Year

Geology 305, 306, 307 and either 402 or 407, Chemistry 230; Physics 340; one option* approved by the Department.

Third Year

Geology 402 (if not taken previously), 403, 405, 454, 467 and either one or two of Geology 406, 407, 421 and 464 to a total of three full courses; Chemistry 370; one option* approved by the Department.

Fourth Year

Five or six of the following: Geology 406, 407, 409, 410, 421, 460, 461, 462, 465 and 466; Physics 420; one option* approved by the Department; a comprehensive examination.

Honors in Geology and Physics

This program is designed to prepare students for graduate work in either Geology or Physics, or for careers in Geophysics. By arrangement with the departments concerned, a student may select from a wide range of courses in Geology or Physics, depending on his interests.

Honors in Geology and Zoology

The Honors Zoology and Geology course is intended to prepare students especially those with an interest in paleontology, for a career in either zoology or geology. By arrangement with his adviser a student may select from a range of courses in Zoology and Geology, depending on his interests and abilities. The following pattern may be considered as typical of the Honors Zoology and Geology program:

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*One Arts option must be included.

First Year

Biology 130 or 230†, Geology 201, Mathematics 201 or Physics 200, English 200 or 210, one Arts option, Physical Education.

Second Year

Biology 230 or Botany 301†, Zoology 350, Geology 305, Geology 306, Chemistry 230, one Arts option.

Third Year

Zoology 300, Geology 403, Geology 407, Genetics 351, Chemistry 350, one Arts option, Zoology 525.

Fourth Year

Zoology 440, any two of Zoology 406, 408, 462, 521; Geology 405, Geology 410, Biochemistry 300, one Science option, Geology 467.

Advice to General Program Students

Students interested in geology may take the equivalent of one to five full courses in this subject. The sequence of courses to be taken is left to each student and is controlled only by the prerequisites listed under the course descriptions. A three-year B.Sc. degree with a five-course concentration in geology can serve as preparation for either graduate work in geology or a geological career in industry if followed, in the latter case, by a fourth year of course-work in geology. A student enrolled in the three-year program may switch to the four-year Honors Geology program after the first year, or, in most cases, after the second year.

Junior Courses—

Geol 201. (3-3; 3-3)

General Geology—Processes of destruction and reconstruction; interpretation of physiographic features with map study; stratigraphic column with index fossils from each period; common minerals and rocks.

Geol 202. (3-3; 0-0)

Physical Geology—An introduction to the study of the earth; materials of the earth's crust; minerals and rocks; geologic processes and time.

Geol 203. (0-0; 3-3)

Historical Geology—Geologic history with special reference to North America; stratigraphic column with index fossils from each period.

Prerequisite: Geology 202 or Geography 201.

Senior Courses—

Geol 302. (3-3; 3-3)

Geology and Mineral Deposits of Canada—The study of the geologic regions of Canada; their stratigraphy, structure, and mineral deposits.

Prerequisite: Geology 201 or consent of Department. This course is sequential to Geology 201, and is designed for students not majoring in Geology.

†Students without Biology 30 are required to take Biology 130 in their First Year and Biology 230 in their Second Year; students with Biology 30 should take Biology 230 in their first year and Botany 301 in their second year.

Geol 305. (3-3; 0-0)

Principles of Paleontology—Morphology, paleoecology, and evolution of the Porifera, Coelenterata, Brachiopoda, Mollusca, Echinoderma, and Trilobita.

Prerequisite: Geology 201 or consent of Department.

Geol 306. (0-0; 3-3)

Principles of Sedimentation and Stratigraphy—Sedimentary processes, environments and facies; properties and classification of sedimentary rocks; stratigraphic nomenclature and the stratigraphic column; principles of stratigraphic paleontology.

Prerequisite: Geology 201 or consent of Department.

Geol 307. (3-3; 0-0)

Elementary Mineralogy—Principles of geometrical crystallography; physical and chemical properties of minerals. Determinative mineralogy.

Prerequisite: Geology 201 or consent of Department.

Geol 402. (0-0; 3-3)

Principles of Structural Geology—Theoretical structural geology; non-orogenic structure; faults; folds; elementary petrofabric analysis; problems on folding and faulting.

Prerequisite: Geology 201 and Physics 240, or consent of Department.

Geol 403. (3-3; 0-0)

Stratigraphy (I)—Historical geology of North America from the Precambrian to the Devonian; Cambrian to Devonian stratigraphic paleontology.

Prerequisite: Geology 305 and 306.

Geol 405. (0-0; 3-3)

Stratigraphy (II)—Historical geology of North America from the Carboniferous to the Cenozoic; Carboniferous to Cenozoic stratigraphic paleontology.

Prerequisite: Geology 305 and 306.

Geol 406. (0-0; 3-3)

Geotectonics—Origin and gross tectonic framework of ocean basins, continental margins and continents; causes of orogenesis; structural geology of North America; problems on folding and faulting; interpretation of geologic maps.

Prerequisite: Geology 402.

Geol 407. (0-0; 3-3)

Paleontology—Morphology, paleoecology and evolution of the lesser invertebrates, vertebrates, and plants.

Prerequisite: Geology 305 or consent of Department.

Geol 409. (3-3; 0-0)

Geochemistry—A survey of chemical processes taking place in geologic settings with emphasis on the abundance relationships of the elements in the earth's crust and the laws governing the migration and distribution of the elements of the earth.

Prerequisite: Geology 454 and Chemistry 370, or consent of Department.

Geol 410. (3-3; 3-3)

Micropaleontology—Principles of micropaleontology, techniques, systematic treatment of Foraminifera.

Prerequisite: Geology 305.

Geol 411. (3-3; 0-0)

Geochemical Prospecting—The application of geochemistry in the search for mineral deposits.

Prerequisite: Consent of Department.

Geol 421. (0-0; 3-3)

Intermediate Mineralogy—Chemical crystallography, theory of X-ray diffraction, and phase equilibria.

Prerequisite: Geology 307 and Chemistry 370, or consent of Department.

Geol 454. (3-3; 3-3)

Petrology—Introduction to petrography; optical properties of common rock-forming minerals; classification and genesis of igneous and metamorphic rocks; examination of rock sections.

Prerequisite: Geology 307.

Geol 460. (0-0; 3-3)

Metallic Mineral Deposits—Classification, mode of occurrence, and geological relations of various types of mineral deposits.

Prerequisite: Geology 402 and 307 or consent of Department.

Geol 461. (3-3; 0-0)

Geology of Petroleum, Natural Gas and Coal—Classification, mode of occurrence and geological characteristics of petroleum, natural gas and coal deposits.

Prerequisite: Geology 306 or consent of Department.

Geol 462. (0-0; 1-3)

Photogeology—The application of aerial photographs to the preparation of planimetric and geological maps. Mapping of stratigraphy and structure on aerial photographs.

Prerequisite: Geology 201 or consent of Department.

Geol 464. (0-0; 3-3)

Introductory Sedimentary Petrology—Processes of sedimentation; weathering, transportation, deposition, diagenesis; classification and description of sedimentary rocks.

Prerequisite: Geology 306 and 454.

Geol 465. (3-3; 0-0)

Geomorphology—A study of land forms and the processes which create and modify them; weathering, mass-wasting, stream erosion, wave erosion, wind erosion, and glaciation; study of land forms on aerial photographs and topographic maps; field trips.

Prerequisite: Geology 201 or consent of Department.

Geol 466. (0-0; 3-3)

Glacial Geology—Elements of glaciology; description of glacial deposits and land forms; glacial stratigraphy of North America and Europe; interpretation of glacial features from topographic maps and aerial photographs; examination of glacial sediments; field trips.

Prerequisite: Geology 201 or consent of Department.

Geol 467.

Field School—A ten-day field school for third year students to be held following the Spring examination period. Topographic and geologic mapping techniques; detailed mapping of the stratigraphy and of the primary and secondary structures of a small highly deformed area.

Prerequisite: Geology 402, 403 or consent of Department.

Honors and Graduate Courses—

Geol 501. (0-0; 3-0)

Advanced Structural Geology—Advanced structural topics will be treated on a seminar basis.

Prerequisite: Geology 406 or consent of Department.

Geol 502. (2s-0; 2s-0)

Sedimentary Petrology and Sedimentation—Papers on sedimentary topics will be presented at a weekly seminar. Normally the first term will be spent largely on papers dealing with mechanical sedimentation and the second term on chemical sedimentation.

Prerequisite: Geology 464.

Geol 503. (3-3; 3-3)

Advanced Stratigraphy

Geol 507. (0-0; 3-3)

Advanced Metamorphic Petrology—Discussion of classic and recent papers dealing with genesis of metamorphic rocks. Laboratory study of representative suites of thin sections.

Prerequisite: Geology 454 or consent of Department. Offered alternate years. Not given 1966-67.

Geol 508. (3-3; 0-0)

Precambrian Geology—A study of the geological record of Precambrian time, with special reference to the Canadian Shield.

Prerequisite: Geology 401 and 403. Offered alternate years. Given 1966-67.

Geol 510. (3-0; 0-0)

Advanced Mineralogy—A study of mineral equilibria, both natural and synthetic.

Prereqiusite: Geology 421 or equivalent.

Geol 511. (0-0; 3-3)

Regional Structural Geology—The geological structure of certain areas in different parts of the world will be studied on a seminar basis.

Prerequisite: Geology 406 or consent of Department.

Geol 512. (3s-0; 0-0)

Pleistocene Geology—The course is a seminar for discussion of particular problems in geology of the Pleistocene period. Each year a general topic for the seminar is chosen and participants select specific phases of the general topic for discussions which they present in the form of a scientific paper. Evaluation of recent reearch in the subject matter under discussion is stressed.

Prerequisites: Geology 465 and Geology 466 or equivalent or consent of Department.

Geol 513.

Field Work in Geomorphology and Glacial Geology—Mapping of surficial deposits and landforms of selected areas in central Alberta. One day of field work each week (½ year course).

Prerequisite: Geology 465 and 466 or consent of Department.

Geol 514. (1-3; 0-0)or(0-0; 1-3)

Rock Analysis—The quantitative chemical analysis of silicate rocks. Problems in sampling, solution, separations and final determination of the constituents are discussed.

Prereqiusite: Chemistry 312 or consent of Department.

Geol 515. (2s-4; 0-0)or(0-0; 2s-4)

Advanced Micropaleontology

Geol 516. (3s-0; 0-0)or(0-0; 3s-0)

Advanced Paleontology

Geol 517. (0-0; 3s-0)

Advanced Geochemistry

Geol 609. (0-8; 0-0)or(0-0; 0-8)

Geological Research

Geol 610. (0-0; 2-0)

Isotope Geology—The investigation and elucidation of geologic phenomena by means of variations in the natural isotopic composition of the elements; abundance of the naturally occurring nuclides; isotopic fractionation; radioactivity; geochronology.

Prerequisite: Consent of Department.

Geol 611. (3s-3; 0-0)or(0-0; 3s-3)

Palynology

Geol 612. (3s-0; 0-0)

Ore Deposits

Geol 613. (0-0; 3s-0)

Mineralogy Seminar—Topics covering recent work in mineralogy.

Paleontology

Paleo 518. (3-0; 0-0)

Paleontology of the Lower Vertebrates—The origin, classification, evolution and historical distribution of the fishes, amphibians, reptiles and birds.

Prerequisite: Consent of Instructor.

Paleo 519. (0-0; 3-3)

Paleontology of the Higher Vertebrates—The origin, classification, evolution and historical distribution of the mammals; particular emphasis on the fossil history of the carnivores and "ungulates".

Prerequisite: Consent of Instructor.

Paleo 620. (1-0; 1-0)

Problems in Vertebrate Paleontology—A seminar course dealing with specific topics of current research interest in vertebrate paleontology.

Prerequisites: Paleontology 518, 519.

MATHEMATICS

Professors—E. S. Keeping (Sessional), A. E. Livingston, L. Lorch, J. R. McGregor, J. McNamee, L. Moser (Head), T. V. Narayana, A. Sharma, M. Wyman.

Associate Professors—W. A. ALSalam, W. J. Bruce, G. C. Cree, D. R. Crosby, T. Fostvedt (Secretary), W. Israel, R. C. Jacka, H. F. Lowig, K. L. Mehra, A. Meir, J. W. Moon, E. Phibbs, J. R. Pounder, J. Sanders, V. Subbarao, E. L. Whitney, D. W. Willett.

Assistant Professors—F. A. Baragar, R. Bercov, D. W. Boyd, T. A. Burton, K. M. Garg, F. I. Gross, C. S. Hoo, R. L. McKinney, J. W. Macki, M. G. Mudeshwar, S. A. Naimpally, R. G. Sinclair, R. J. Tait, J. R. Trollope, Zennia H. Trollope, J. S. W. Wong.

B.Sc. with Honors in Mathematics

First Year

Mathematics 206 and 271; Physics 244; one Arts option; one option; Physical Education.

Second Year

Mathematics 306; two Mathematics or Statistics options; one Science option; one Arts option.

Third Year

Mathematics 440; Mathematics 410 or 425 or 426; Mathematics or Statistics option; two options.

Fourth Year

Two Mathematics or Statistics options; three options.

NOTES: The four-year program must include Mathematics 410, 425 and 426, three Arts options, and at least one of Mathematics 309 or 421, or Statistics 256 or 455, or Computing Science 310 or 460. Thus a full honors program consists of at least ten mathematics courses. The program must be approved by the Honors Advisory Committee of the Mathematics Department.

The Arts options may include beginners' language courses such as German 210 or Russian 210.

B.Sc. with Honors in Applied Mathematics

The B.Sc. degree with Honors in Applied Mathematics may be taken by students who wish to specialize in mechanics, including hydrodynamics, aerodynamics, elasticity and the theory of relativity.

First Year

As above.

Second Year

Mathematics 306 and 309; Science option; Physics option; Arts option.

Third Year

Mathematics 421, 426 and 440; two options.

Fourth Year

Mathematics 522; Mathematics 554 or 555; Mathematics 550 or 580, or Physics 480 or 510 or 570; two options.

NOTE: The four-year program must include Mathematics 430 and three Arts options. The program must be approved by the Honors Advisory Committee of the Department of Mathematics. The Arts options may include beginners' language courses such as German 210 and Russian 210.

B.Sc. with Honors in Mathematical Statistics

First Year

Mathematics 206 and 271; Physics 244; one Arts option; one option; Physical Education.

Second Year

Mathematics 306; two Mathematics or Statistics options; one Science option; one option.

Third Year

Mathematics 440; Mathematics 325 or 410 or 426; Mathematics or Statistics option; two options.

Fourth Year

Two Mathematics or Statistics options; three options.

NOTE: The four-year program must include Mathematics 325, 410 and 426, Statistics 455, and Statistics 560 or 562 or 564 or 565 or 570, and three Arts options.

Advice to General Program Students

Students planning to take mathematics as a subject of concentration are advised to consult the department as early as possible regarding the choice of their courses. Fundamental courses are Mathematics 201 or 207, Mathematics 270 or 274, and Mathematics 304. For students wishing to proceed to graduate work in mathematics, the sequence Mathematics 201, 304, and 404 is essential. Students wishing to enter the teaching profession are advised to include Mathematics 207, Statistics 255, Mathematics 274 and 374.

A general course student may take Mathematics 206 in lieu of 201 or 207 in first year provided he has the permission of the Department. If a student

passes Mathematics 206 he may apply to the Department for admission to second year Honors. A student with a good record in Mathematics 201 or 207 may also apply to the Department for admission on the understanding that this record will be considered equivalent to Mathematics 206. If such a student is granted admission he must satisfy all the requirements of the honors program he has chosen.

Math 100. (3-0; 3-0)

Elements of Algebra—The topics of Mathematics 30.

Math 101. (2-0; 0-0)

Trigonometry—Trigonometric functions, equations, and identities. Solution of triangles. Logarithms.

Prerequisite: 70% standing in Mathematics 30 and 70% standing in the required courses of Grade XII or special permission of the Dean.

NOTE: This course cannot be taken for credit towards a degree.

Math 180. (4-0; 4-0)

Trigonometry and Polynomial Calculus—Trigonometric functions and identities. Solution of triangles. Simple algebraic curves. Differentiation and integration of elementary functions. Applications.

Prerequisite: Mathematics 30 or its equivalent.

Math 201. (5-0; 5-0)

Introductory Calculus—Rates of change. Differentiation and integration of simple functions. Applications. Analytic geometry of the conic sections. Exponential, logarithmic and trigonometric functions.

Prerequisite: Mathematics 30 and 31 or their equivalents.

Corequisite: Some students lacking Mathematics 31 or its equivalent may take Mathematics 201 by taking Mathematics 101 concurrently. (See the conditions under which a student may take Mathematics 101.)

Math 206. (5-0; 5-0)

Calculus—Functions. The derivative and anti-derivative, differential. The integral and its applications. Fundamental Theorem. Differentiation and integration of elementary functions of one or more variables. Simple differential equations.

Prerequisite: Mathematics 30 and 31 or their equivalents.

NOTE: This course is recommended for students with at least a 75 per cent grade in Mathematics 30. Other students may be admitted with the consent of the Department.

Math 207. (5-0; 5-0)

Elementary Calculus (Arts and Education)—Real numbers. Functions and graphs. Differentiation and applications. Analytic geometry. Integration and applications. Trigonometric, exponential and inverse functions.

Prerequisite: Mathematics 30 and 31 or their equivalents.

Corequisite: Some students lacking Mathematics 31 or its equivalent may take Mathematics 207 by taking Mathematics 101 concurrently. (See the conditions under which a student may take Mathematics 101.)

Math 220. (3-0; 3-0)

Elementary Calculus—Differentiation and integration of trigonometric functions. Polar co-ordinates. Logarithmic and exponential functions. Conic sections. Areas and volumes.

Prerequisite: Mathematics 180.

Math 240. (3-1; 0-0)and(0-0; 3-1)

Elementary Calculus—Limits and derivatives. Differentiation of simple functions. Graphs, extrema and inequalities. Integration of simple functions. Infinite sequences and series.

Prerequisite: Mathematics 30 or equivalent.

Not available for First Year students in Arts or Science.

(NOTE: This course is designed as a prerequisite for Statistics 241.)

Math 242. (3-1; 3-1)

Elementary Calculus and Probability—Limits and derivatives. Differentiation of sample functions. Graphs, extrema and inequalities. Integration of simple functions. Infinite sequences and series.

Elementary set theory Finite sample spaces. Probability as a set function. Conditional probability and Bayes' formula. Hypergeometric and binomial distributions. Moments standardization and the law of large numbers. Density and distribution functions of continuous random variables. Expectation. Poisson and normal approximations of the binomial distribution.

Prerequisite: Mathematics 30 or equivalent.

Math 243. (3-2; 0-0)

Linear Algebra—Vector and matrix operations. Linear systems of equations, dimension, axiomatic definition of vector space, constructive solution of linear equations, computation of inverses. Linear inequalities, convex sets, introduction to linear programming. Binary relations: equivalence, order, graphs. Invariants, canonical forms, eigenvalues and quadratic forms. Finite Markov chains.

Prerequisite: Mathematics 30.

Math 250. (3-0; 3-0)

Theory of Finance—Application of percent, interest, annuities certain, sinking funds and amortizations, valuations of bonds, depreciation. Life annuities and life insurance.

Prerequisite: Mathematics 30.

Math 260. (3-0; 3-0)

The Nature of Mathematics—A survey of the history, methodology, achievements and goals of mathematics, with illustrations from elementary geometry, topology, number theory, algebra and analysis.

This is a terminal course for students not intending to proceed with Mathematics. It is not an option in the Mathematics pattern.

Prerequisite: Mathematics 30.

Math 270. (3-0; 3-0)

Introduction to Algebra and Geometry—Structure of the number system. Mathematical induction. Binomial and multinomial theorems. Sets. Logic

of simple and compound statements. Vectors and lines. Inner and cross products. The complex plane. Vector geometry. Matrix algebra. Groups of transformations.

Prerequisite: Mathematics 30.

Math 271. (3-0; 3-0)

Algebra and Geometry (Honors)—Vectors. Analytical geometry of the line and plane. Conics and quadrics. Linear transformations and matrices. Determinants. Groups of transformations. Abstract groups, rings, fields.

Prerequisite: Mathematics 30 and 31.

NOTE: This course is recommended for students with at least a 75 per cent grade in Mathematics 30. Other students may be admitted with the consent of the Department.

Math 274. (3-0; 3-0)

Algebra and Geometry—Logic and sets. Axiomatic geometry. Rotation of axes. Linear equations. Vectors, matrices and determinants. Mathematical systems (scales of notation). Mathematical induction. Binomial theorem. The axiomatic approach to the number system. General algebraic systems.

Prerequisite: Mathematics 30.

Senior Courses—

Math 304. (3-2; 3-2)

Calculus and Analytical Geometry—Determinants. Polar and parametric coordinates. Methods and applications of integration. Infinite series. Vectors and space geometry. Partial differentiation. Complex numbers. Multiple integrals. Elements of linear differential equations.

Prerequisite: Mathematics 201 or 220, or equivalents.

Math 306. (5-0; 5-0)

Advanced Calculus—Sequences and series, differential calculus of scalar fields, linear differential equations, multiple integrals. Line integrals. Theorems of Gauss, Green, and Stokes.

Prerequisite: Mathematics 206 or consent of Department.

Prerequisite or corequisite: Mathematics 271.

NOTE: This course is required for second year Honors students in Mathematics and Physics. Other students admitted only with the consent of Department.

Math 307. (5-0; 5-0)

Calculus and Analytic Geometry (Arts and Education)—Polar coordinates. Rotation of axes. Analytical geometry of three dimensions. Partial derivatives. Multiple integrals. Sequences and series. Introductory differential equations.

Prerequisite: Mathematics 207.

Math 308. (3-0; 0-0)

Differential Equations—First-order equations. Equations with constant coefficients. Linear equations of the second order. Systems of equations. Sturm-Liouville theorem and orthogonal expansions.

Prerequisite: Mathematics 206.

Math 309. (3-0; 3-0)

Mechanics—Foundations. Statics and the principle of virtual work. Kinematics. Plane motion of a particle and a rigid body. Conservation laws. Harmonic oscillator. Motion in a central field. Impulsive motion.

Prerequisite: Physics 240 or 244.

Prerequisite or corequisite: Math. 306.

NOTE: This course is primarily intended for Honors students in Mathematics. Other students admitted only with the consent of Department.

Math 310. (3-0; 3-0)

Elementary Mechanics—Newton's Laws. Plane statics. Systems of forces. Centre of mass. Friction. Principle of virtual work. Thin beams. Plane kinematics and dynamics of a particle. Projectile motion. Circular motion and simple harmonic motion. The conservation laws. Stability of equilibrium. Plane motion of a rigid body. Impulsive motion.

Prerequisite: Mathematics 201 or equivalent.

Corequisite: Mathematics 304 or equivalent.

Math 320. (1-0; 1-0)

Statistical Treatment of Experimental Data—Errors of observation, systematic and random. Frequency distributions. The mean and standard deviation. The binomial and Poisson distributions. The Gaussian law of error. Two-variable problems—regression and correlation. Fitting of curves by least squares. Relation between sample and population. Confidence limits. Significance of experimental results.

Prerequisite: Mathematics 306.

NOTE: This is a required course in the Honors Physics program. It will be admissible in other programs only as an extra.

Math 325. (3-0; 3-0)

Introductory Linear Algebra—Systems of linear equations. Linear transformations and matrices. Algebra of matrices. Determinants. Abstract vector spaces. Transformations of coordinates. Characteristic values, similarity, diagonalization. Orthogonalization. Canonical forms for matrices. Quadratic forms. Quadric surfaces. Inner products.

Prerequisite: Mathematics 271 or consent of Department.

NOTE: This course is primarily intended for Honors students. Other students admitted only with the consent of the Department.

Math 326. (3-0; 0-0)

Introductory Linear Algebra—Systems of linear equations. Linear transformations and matrices. Albegra of matrices. Determinants. Abstract vector spaces. Transformation of coordinates. Characteristic values, similarity, diagonalization.

Prerequisite: Mathematics 271 or consent of Department.

NOTE: This course is the first half of Mathematics 325 above. It is primarily intended for Honors students. Other students admitted only with the consent of the Department.

Math 340. (0-0; 3-2)

Analysis, Difference and Differential Equations—Functions of several variables. Partial derivatives, extreme values, Lagrange multipliers, complex numbers and expontials. Euler's formula. Linear difference and differential equations with constant coefficients. Interpolation procedures. Systems of linear equations. Numerical solutions and iterative methods.

Prerequisite: Mathematics 240 or 242 or equivalent.

Math 360. (3-0; 3-0)

Geometry—Various concepts of space (Euclidean, affine, projective and non-Euclidean), axiomatic treatment and models, relation to group theory. An introduction to point set topology (open and closed sets, Hausdorff and metric spaces).

Prerequisite or corequisite: Mathematics 304 or 306 or consent of Department.

Math 374. (3-0; 3-0)

Algebra and Geometry—Selected topics in projective and other non-Euclidean geometries. Groups, rings, fields. Vector spaces. Lattices and Boolean algebra.

Prerequisite: Consent of the Department.

Math 404. (3-0; 3-0)

Advanced Calculus — Vector analysis. Ordinary differential equations. Series solutions of differential equations. Gamma, Bessel and Legendre functions. Fourier series. Boundary value problems.

Prerequisite: Mathematics 304 or its equivalent.

(This course is available to Honors Chemistry students and to students in the Mathematics and Physics pattern.)

Math 410. (3-0; 3-0)

An Introduction to Set Theory and Elementary Topology—The algebra of sets, relations, cardinal arithmetic, the axiom of choice, real numbers, topology of metric spaces. Emphasis will be placed on presenting topics with a view to applications.

Prerequisite: Mathematics 306 or consent of the Department.

Math 421. (3-0; 3-0)

Boundary Value Problems—Partial differential equations of mathematical physics, Bernoulli's separation of variables, series solutions, existence and uniqueness theorems, Sturm-Liouville systems, eigenvalues and eigenfunctions, classical orthogonal functions, Fourier series and integrals. (For Honors students in Mathematics and Physics).

Prerequisite: Mathematics 306 or consent of the Department.

Math 423. (3-0; 3-0)

Differential Geometry—Theory of surfaces. Quadratic differential forms. Geodesics and curvature. Riemannian manifolds. Exterior differential forms.

Prerequisite: Mathematics 306 and 308.

Math 424. (3-0; 3-0)

Algebra and Number Theory—Fundamental Theorem of Arithmetic. Continued fractions. Linear congruences. Elementary theory of arithmetic functions. Sum of squares. Quadratic reciprocity. Groups, rings, integral domains, fields.

Prerequisite: Mathematics 270 or 271 or 274.

NOTE: This course is primarily for B.A. students. Other students admitted only with the consent of the Department.

Math 425. (3-0; 3-0)

Abstract Algebra I—Groups, rings, fields. Polynomials, abstract vector spaces. Matrix algebra.

Prerequisite: Mathematics 271 and 306.

Math 426. (3-0; 3-0)

Complex Variables—Complex numbers. Functions of a complex variable. Cauchy-Riemann equations. Cauchy's Theorem. Calculus of residues. Conformal mapping.

(For Honors students in Mathematics and Physics.)

Prerequisite: Mathematics 306 or 404 or 405 or 406 or 407.

Math 430. (3-0; 3-0)

Advanced Mechanics—Review of Newton's Laws. Lagrange's equations derived from Newton's Laws and D'Alembert's principle. The central force problem. Motion of a rigid body. Tops and gyroscopes. Variational principles. Hamilton's equations. Canonical transformations. Hamilton-Jacobi equation.

Prerequisite: Mathematics 309 or Physics 370 or consent of the Department.

Math 440. (3-0; 3-0)

Real Variables I—Sequences and series of constants and functions, double series, infinite products, Cesaro and Abel summability, uniform convergence. Metric spaces: limits, continuity, connectedness, compactness. Weierstrass, Picard, and Arzela theorems. Introduction to the Lebesgue integral on the line. Fourier series and integrals.

Prerequisite: Mathematics 306 or consent of the Department.

Honor and Graduate Courses—

Math 500. (3-0; 3-0)

Theory of Functions of a Complex Variable—Complex numbers. Complex series. Functions of a complex variable. Cauchy's theorem and the calculus of residues. Integral functions. Conformal representation. The Laplace and Fourier transforms.

Prerequisite: Mathematics 404 or 405 or 406 or 407.

NOTE: Only one of Mathematics 500 and 501 may be taken for credit towards a degree.

Math 501. (3-0; 3-0)

Theory of Functions of a Complex Variable—The complex number system. Complex-valued functions. Convergence of series. Complex integration. Representation theorems. Calculus of residues.

Prerequisite: Mathematics 440 and 426 or consent of Department.

NOTE: Only one of Mathematics 500 and 501 may be taken for credit towards a degree.

Math 502. (3-0; 3-0)

History of Mathematics—The Alexandrian School and the foundations of geometry. Saccheri and the beginnings of modern geometry. The renaissance of algebra in Europe, the Arabic Heritage. Cartesian, metric and projective geometrics. Development of calculus and mechanics. Logical foundations of mathematics.

For B.A. Honors students in Mathematics.

Prerequisite: Mathematics 306 and 360.

Math 505. (3-0; 3-0)

Foundations of Analysis—The development of the number system from the natural numbers to the complex numbers. Proofs and definitions by induction. General sums and products. Decimal expansion of a real number. Finite, countable, and uncountable sets. Cardinal numbers. Well-ordered sets, ordinal numbers.

Prerequisite: Mathematics 425.

Math 510. (3-0; 3-0)

Abstract Algebra II—Peano's axioms and their development. Structure theory of groups and rings. Galois theory. Valuation theory of fields. Lattice theory and Boolean algebras.

Prerequisite: Mathematics 425.

Math 515. (3-0; 3-0)

Number Theory—Divisibility; congruences; primitive roots; quadratic reciprocity. Number-theoretic functions and the distribution of primes. Diophantine problems. Rational approximations to real numbers.

Math 520. (3-0; 3-0)

Differential Geometry—Survey of classical differential geometry. Curvature of curves and surfaces. Synthetic differential geometry. Axiomatic treatment of topological and general metric spaces. Applications to non-Euclidean, Riemannian, Finsler and Busemann spaces.

Math 522. (3-0; 3-0)

Partial Differential Equations—First Order Equations. Classification of higher order equations. Integral transform method of solutions. Elements of potential theory. The wave equation in 1, 2, and 3 space dimensions. The heat equation. Integral equations including the Fredhalm Theory and the Hilbert-Schmidt theory. Applications of integral equations to boundary value and eigenvalue problems.

Prerequisite: Mathematics 421 or consent of the Department.

Math 541. (3-0; 3-0)

Real Variables II

Prerequisite: Mathematics 440 or consent of Department.

Math 550. (3-0; 3-0)

Generalized Dynamics and Special Relativity Theory

Math 554. (3-0; 3-0)

Theory of Elasticity—Stress, strain, stress-strain relations. Stretching, bending, torsion, and flexure of cylinders. Two-dimensional problems with an introduction to the work of Muskelvili. Introduction to three-dimensional problems. Variational methods.

Prerequisite: Mathematics 408 or 426 or 500 or consent of the Department.

Math 555. (3-0; 3-0)

Hydro- and Aero-dynamics—Classical hydrodynamics. Kutta-Joukowski theory of airfoils. Boundary layers. Flow of a viscous fluid. Supersonic flow. Shock waves.

Math 580. (3-0; 3-0)

Tensor Analysis—Algebra of tensors. Covariant differentiation. Applications of tensorial methods to the geometry of curves and surfaces, analytical dynamics, elasticity, the special and general theories of relativity, and cosmology.

Math 600. (3-0; 3-0)

Analysis—Linear transformations. Orthogonal functions. Integral equations. Eigenvalue problems. Special functions, including Bessel, Legendre and Tchebycheff functions. Asymptotic expansions.

Math 601. (3-0; 3-0)

Theory of Fields—Galois theory. Structure of fields. Valuation theory.

Math 604. (3-0; 3-0)

Measure Theory

Math 605. (2-0; 2-0)

Mathematical Logic—Sentential calculus; lower predicate calculus; Boolean algebra; structures; Goedel's completeness theorem.

Math 610. (3-0; 3-0)

Calculus of Finite Differences—Introduction to the properties of difference operators, with application to the solution of linear difference equations.

Math 615. (3-0; 3-0)

Integral Equations — Linear integral equations. Applications of general theory to the equations of Abel, Fredholm and Voleterra.

Math 616. (3-0; 3-0)

Topics in Functional Analysis—Selected chapters from the theory of linear spaces and operators, harmonic analysis, spectral theory and applications. (The content may vary from time to time.)

Prerequisite: Mathematics 500 or 501 and consent of Department.

Math 620. (3-0; 3-0)

Advanced Complex Analysis—Geometrical aspects of the theory of functions of a complex variable. Conformal mapping. Riemann surfaces. Representation of analytic functions. Problems of convergence. (Topics may vary from year to year.)

Prerequisite: Mathematics 500 or 501 or equivalent.

Math 621. (3-0; 3-0)

Ordinary Differential Equations (Advanced) — Existence and uniqueness theorems; dependence of solutions on parameters and on initial conditions. Linear differential equations. Linear systems with isolated singularities of the first and second kind. Asymptotic behavior of nonlinear systems; stability.

Prerequisite: Mathematics 421 or equivalent.

Math 624. (3-0; 3-0)

Combinatorial Analysis—Recurrence relations and generating series for combinatorial problems. Partitions and compositions. Trees and graphs. Ramsey's Theorem. Zero-one matrices and combinatorial designs.

Math 625. (3-0; 3-0)

Analytical Number Theory—Analytic theory of the distribution of primes. The Selberg-Erdös method. Distribution of power residues. Analytic methods in combinatorial problems and in additive number theory.

Prerequisite: Mathematics 515.

Math 630.

General Topology—Topologies, neighbourhoods, closed sets, accumulation points, bases, subbases, relativization, separation. Connectedness. Nets and filters. Continuity, homeomorphism. Product and other related topologies. Embedding and metrization, axioms of countability, separation axioms. Compactness. Compactifications. Quasi-uniform and uniform spaces, completion. Function spaces. Equicontinuity.

Math 631. (3-0; 3-0)

Algebraic Topology—Combinatorial topology of surfaces; mapping and fixed point theorems; covering spaces; homology theory and Betti-groups; connectivity.

Math 645. (3-0; 3-0)

Lattice Theory—Partially ordered sets, lattices and complete lattices. Graphs of finite lattices. Distributive and modular lattices. Complemented lattices. Boolean rings. Generalized projective geometry and continuous geometry.

Prerequisite: Mathematics 425 or equivalent, and consent of Department.

Math 670.

Topics in Algebra

Prerequisite: Consent of Department.

Math 671.

Topics in Analysis

Prerequisite: Consent of Department.

Math 672.

Topics in Geometry

Prerequisite: Consent of Department.

Math 673.

Topics in Applied Mathematics

Prerequisite: Consent of Department.

Math 691. (3-0; 3-0)
Group Theory

Math 695. (3-0; 3-0)
Advanced Relativity Theory

Physics

Phys 680
Advanced Quantum Mechanics

Phys 682.
Advanced Electromagnetic Theory

Phys 685.
Advanced Statistical Mechanics

Phys 688.
Solid State Theory

Phys 690.
Quantum Theory

Phys 692.
Group Theory and Applications

Phys 697.
Nuclear Structure

Phys 699.
Selected Topics in Theoretical Physics

NOTE: The above courses are given in the Physics Department. Some of these may be selected as part of a graduate program in Mathematics.

METEOROLOGY

Instruction offered by members of the Department of Geography.

1. The Department of Geography offers the M.Sc. in Meteorology. The program will be prepared under the regulations for the Master's Degree, with the language requirement of a reading knowledge of a modern foreign language other than English. Prerequisite to this program is an Honors B.Sc. degree or equivalent, with adequate preparation in mathematics and physics. Prospective candidates should write and inquire of the Department concerning their interests and their background.
2. The program of study will include four courses in Meteorology, which should include Meteorology 405, 511, 514 and 515. If the candidate has no course in Statistics, he should also include an acceptable course in Statistics.
3. A second program leading to an M.Sc. degree, given with the co-operation of the Meteorological Branch, Department of Transport, requires 20 months of study. The first academic year will include Meteorology 405, 511, 512, 513, 514, 515, an acceptable course in Statistics, and seminar. There will be no foreign language requirement for this degree. During the second year, a student will take Meteorology 525, 505 or other acceptable course, and prepare a thesis.

Meteo 405. (3-0; 3-0)

Introduction to Theoretical Meteorology—A study of the physics of the atmosphere, including thermodynamics, stability, radiation, equations of motion, friction, and some reference to turbulence.

Meteo 505.

Reading Course in Meteorology

Meteo 511. (3-0; 3-0)

Synoptic Meteorology—Structure of the Atmosphere. The structure and behaviour of weather systems. Planetary Scale Motion Systems. Jet Streams. Vertical Motion. Condensation Phenomena. Meso-scale Phenomena.

Meteo 512. (0-4; 0-4)

Synoptic Meteorology Laboratory—A complementary course to Meteorology 511. Analysis of surface and upper air charts, and cross sections. Forecasting methods. Prognosis by graphical and computer methods.

Meteo 513. (2-0; 2-0)

Physical Meteorology—Atmospheric Radiation. Solar and Terrestrial Radiation. Radiation Calculation. Physics of Clouds and Precipitation. Radar Meteorology. Atmospheric Electricity. The Stratosphere and higher layers of the atmosphere.

Meteo 514. (3-0; 0-0)

Climatology—The General Circulation. Climatic classification. Climates of the Continents. Climate and hydrology. Climatic Change. Microclimatology.

Meteo 515. (0-0; 3-0)

Meteorological Statistics—Application of Statistics to Meteorology. Fourier Analysis of Time series. Power spectrum Analysis and Stochastic processes.

Meteo 525. (3-0; 3-0)

Advanced Topics in Dynamic Meteorology—Elements of numerical weather prediction. Atmospheric turbulence and diffusion. Atmospheric energy and energy transformation. Mathematical models.

Meteo 555.

Research in Meteorology

MICROBIOLOGY

Professors—G. E. Myers, W. E. Razzell (Head).
Associate Professors—J. N. Campbell, D. W. S. Westlake, T. Yamamoto.
Assistant Professor—C. H. Pai.

Honors in Microbiology

First Year

Biology 130 or 230, Chemistry 230, Mathematics 201, Physics 200, English 200 or 210, Physical Education.

Second Year

Microbiology 360, option, Chemistry 350, recommended option or Plant Science 455, a language course (German 210 or Russian 210 or French 200 recommended).

Third Year

Microbiology 401, Chemistry 370, Biochemistry 300, Genetics 351, an Arts option.

Fourth Year

Microbiology 402, Genetics 530, Microbiology 503*, an Arts option, an option.

Advice to General Program Students

Students considering microbiology as a possible subject of concentration are advised that Microbiology 360 serves as an introduction to courses in microbiology given in this and other departments.

Micrb 201. (3-3; 0-0)

Elementary Microbiology—Simple general microbiology, the importance of bacteria in everyday life. Demonstrations and practical laboratory exercises.

Micrb 360. (3-3; 3-3)

General Microbiology—A course in general microbiology including classification, physiology and metabolism, serving as an introduction to the practical application of this knowledge in industrial processes, specific fields of animal and plant biology and public health. The laboratory course illustrates the basic methods of studying micro-organisms and their products, and introduces the principles of the application of this knowledge.

Prerequisites: A University course in Chemistry and Biology 230 or consent of Department.

Textbook: Stanier, Doudoroff, Adelberg, *The Microbial World,* or Pelczar, Reid, *Microbiology.*

Micrb 361. (3-3; 3-3)

Pathogenic Bacteriology—The relation of bacteria, viruses, fungi and protozoa to disease. The isolation and identification of bacteria pathogenic to man. A study of bacterial infections and of resistance and immunity. Some consideration will be given to comparative bacteriology.

Prerequisite: Microbiology 360 or Bacteriology 201.

(Not available for the general student in 1965-66)

Micrb 401. (3-0; 3-0)

Immunology—A lecture course dealing with the basic mechanisms underlying immunity and immunological unresponsiveness interpreted on the cellular and subcellular levels.

Prerequisites: Microbiology 360 (or equivalent) and a University course in Biochemistry, or consent of Department.

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*During the fourth year each candidate for the Honors degree will be required to conduct a directed studies problem under the supervision of a faculty member. The problem will, if possible, be related to the special fields of interest of the student and will involve investigation of current literature and some experimental work on the part of the student. The student will be required to submit a written report of the investigation for approval by the supervising faculty member and to make a brief oral presentation of his findings to staff and students of the Department.

Micrb 402. (3-3; 3-3)

Microbial Physiology and Biochemistry—The lecture course deals initially with the chemical make-up of the bacterial cell and proceeds to a discussion of the catabolic and anabolic mechanisms found in micro-organisms. Various oxidative and fermentative systems will be discussed. The metabolism of organic and inorganic nitrogenous compounds, other specific systems, energy relationships and some of the enzymic processes will be presented.

The laboratory consists of projects assigned to small groups of students and designed to provide experience in the use of some of the equipment and techniques commonly employed in the studies of microbial metabolism.

Prerequisites: Microbiology 360, Biochemistry 300 (or its equivalent).

Micrb 403. (3-0; 0-0)or(0-0; 3-0)

Microbial Taxonomy—A study of the history, principles and methods of microbial classification and nomenclature.

Prerequisite: Microbiology 360 or Botany 360 or Botany 330 or 340, or consent of Department.

Micrb 404. (3-3; 3-3)

Virology—A course in general virology including the classification and physical properties of bacterial, plant and animal viruses, and the technical methods used to study them. Various aspects of cell-virus relationships will be discussed. Consideration will be given to viral pathogenesis. Laboratory exercises will illustrate the methods for the propagation and assay of viruses including the use of embryonated eggs and tissue cultures.

Prerequisites: Microbiology 360 and Biochemistry 300, or consent of Department.

Micrb 405. (0-3; 0-3)

Immunology Laboratory—Laboratory exercises to demonstrate quantitiation of the immune response and the isolation and characterization of antigens.

Prerequisite or corequisite: Microbiology 401.

This course will be required of students concentrating in Microbiology as a complement for the lecture course in Immunology (Microbiology 401). It will be optional for other students.

Da and Fd 465. (3-3; 0-0)

Food Microbiology—The microbiology of the food and allied industries including sterilization and preservation (canning, freezing, radiation), food poisoning, food spoilage, the contamination of air and water, the disposal of domestic and industrial wastes.

Prerequisite: Microbiology 360 or permission of Department.

Da and Fd 466. (0-0; 3-3)

Dairy Microbiology—The bacteriology of the production and distribution of fluid milk and cream and consideration of some of the problems of the market milk industry. Milk supplies and public health. The bacteriological and biochemical aspects of pasteurization. The bacteriology of butter, cheese, ice cream, and other milk products.

Prerequisite: Microbiology 360 or permission of Department.

Da and Fd 467. (0-3; 0-3)

Dairy Microbiology—A laboratory lecture course covering some advanced techniques in microbiology including small scale industrial fermentations, and the principles underlying the hygenic production of foods and dairy products and methods for the detection of faults in the various processing plants.

Prerequisites: Plant Physiology and Biochemistry 431 and 432 or Biochemistry 300 and Microbiology 360 or Dairy Science 465 or 466, or permission of the Department.

Graduate Courses—

Micrb 503.

Microbiology—A directed studies program involving specialized reading and supervised experiments, with the presentation of written and oral reports at the end of the course.

Micrb 505. (3-0; 0-0)or(0-0; 3-0)

Advanced Microbial Physiology—A lecture and discussion course on topics of current interest, with reading of original literature.

Micrb 507. (1S-0; 1S-0)

Advanced Microbiology Seminars—Organised preparation and presentation of two formal seminars on topics other than the thesis subject.

Micrb 508. (3-0; 0-0)or(0-0; 3-0)

Advanced Virology—A lecture course on current problems and their implications as fundamental research tools.

Micrb 509. (0-0; 3-0)or(3-0; 0-0)

Current Concepts in Immunology—A lecture and discussion course dealing with an understanding of microbiological phenomena through immunochemical methods.

PHYSICAL SCIENCE

Instruction offered by members of the Department of Physics.

PhSc 341. (3-0; 3-0)

Physical Science—A course designed for B.A. and B.Ed. students to give them some appreciation of fundamental ideas and methods in the physical sciences, of modern trends in this field, and of its relation to other disciplines. Illustrative material will be taken from Physics, Chemistry, Astronomy and Geology, and the history and development of the subject will be stressed.

NOTES: 1. This course may not be used for credit towards the B.Sc. degree.
2. This course is not open to first year students, and may not be taken for credit by students who have credit in Physics 100 or 200.

PHYSICS

Professors—H. Schiff (Chairman), A. B. Bhatia, W. K. Dawson, D. I. Gough, G. C. Neilson, K. B. Newbound, J. T. Sample, D. B. Scott, S. B. Woods (Assistant Chairman).

Associate Professors—D. D. Betts, G. L. Cumming, J. P. Franck, D. G. Hughes, H. R. Krouse, B. V. Paranjape, M. Razavy, S. Sheinin, L. Verdini, F. L. Weichman.

Assistant Professors—P. N. Daykiw (Visiting), D. L. Jones, A. N. Kamal, E. R. Kanasewich, W. J. McDonald, W. C. Olsen, E. H. Pinnington, D. Rankin, G. Roy.

Instructor—G. R. Small

Honors in Physics

First Year

Physics 244, Mathematics 206, Mathematics 271, English 200 or 210, approved option, Physical Education.

First-year Engineering or the first year in the General Program may be accepted in consultation with the department.

Second Year

Physics 350, Physics 370, Physics 380, Mathematics 306, Mathematics 326, Arts option (Russian 210 or German 210 recommended, but any other may be substituted).

Third Year

Physics 440, Physics 474, Physics 480, Mathematics 320, Mathematics 430 or an equivalent course, Mathematics 421.

Fourth Year

Physics 510, Physics 550, Physics 570, Physics 568 laboratory; three of Mathematics 426, Physics 516, Physics 520, Physics 560, Physics 572. Other options in the Fourth year can be arranged in special cases. Students are also expected to take part in the weekly Physics Colloquium.

Honors in Applied Physics

This program is meant to prepare students for careers in industrial research and development or for graduate work in experimental physics or certain fields of engineering. The program features courses in engineering and in applied physics not ordinarily available to honors physics students and is designed so that it may be entered at the beginning of third year by students who have completed two years of honors physics, pass physics or engineering provided they have obtained a 65% average.

Third Year

Physics 440, 468 and 474; Mathematics 404 and 430; Computing Science 310; Physics 350 or Ch.E. 267; Economics 303.

Fourth Year†

A certain degree of flexibility is allowed in the choice of courses for the fourth year. Indicated here for convenience are sample programs which emphasize either nuclear or solid state physics. Other choices may be arranged in consultation with the Physics Department.

†For those who have not yet completed the general honors requirements of the Faculty of Science, an approved A or B option must be taken in place of one of the courses listed.

Nuclear Physics

Physics 572, 576, 480, 510 and 568; Electrical Engineering 461; Physics 516.

Solid State Physics

Physics 572, 540, 480, 510, 516 and 568; Mining Engineering 361.

Honors in Physics (Geophysics Option)

This program is designed to prepare students for careers or graduate work in Geophysics. Students with a greater interest in Geology are referred to the program in Honors Geology and Physics.

First Year

Physics 244, Mathematics 206, Mathematics 271, Geology 201, English 200 or 210, Physical Education.

Second Year

Physics 370, Physics 380, Mathematics 306, Chemistry 230, Arts option (Russian 210 or German 210 recommended).

Third Year

Physics 350, Physics 440, Physics 480, Mathematics 320, Mathematics 421, one of Geology 307 and 402, Chemistry 370, Meteorology 405, a senior geology course, Arts option.*

Fourth Year

Physics 416, Physics 520, Physics 474, Mathematics 426 or 500, and *one* of the following: Chemistry 370, 350, 430, 450, Meteorology 405, 505, a senior geology course.

Advice to General Program Students

1. The Department of Physics offers four alternative junior courses, which differ in prerequisites, detailed content and intended sequel.

Physics 100 is a general survey intended for students who lack credit in Grade XII Physics.

Physics 200 is a terminal course covering the general field, with Grade XII Physics as a prerequisite. It may also be used as the prerequisite for Physics 400 or Astronomy 410 for students who wish to pursue modern topics somewhat further, provided that Mathematics 201 is taken collaterally.

Physics 240 is intended as the first course of a sequence. It is incomplete unless followed by Physics 340, for these two courses cover the general field in a two-year sequence, which can then be followed by more specialized courses in the third year. Physics 30 or Physics 100 and Mathematics 30 and 31 are prerequisite; Mathematics 201 is corequisite.

Physics 244 is designed for students who are contemplating honors in Physics, Geology and Physics, or Mathematics. It is restricted to students who are recommended as qualified for honors on the basis of their matriculation standing.

2. Credit cannot be given towards a degree for both Physics 100 and 200, or for more than one of Physics 200, 240 or 244.

3. For students taking more than one physics course, in the General Program, the following sequences are recommended:

Two course sequence: Physics 200 and 400; or Physics 240 and 340.

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*This may be taken in Fourth Year instead.

Three course sequence: Physics 240, 340 and 400.

Four or five course sequence: Physics 240 and 340; two or three of Physics 400, 405, 420, 440 or Astronomy 410. Mathematics 304 is advisable in the second year.

Phys 100. (3-3; 3-3)

Introductory General Physics—Introduction to the experimental phenomena and theoretical ideas of physics. This course may be taken as a substitute for Grade XII physics, but is given from a more advanced point of view with greater reference to current developments. This course may not be taken for credit by students who already have credit for Physics 30.

Phys 200. (3-3; 3-3)

Basic General Physics—The mechanical, thermal, electromagnetic and optical properties of matter; the forms and transformations of energy; introduction to the atomic theories of modern physics.

(For a continuation, see Physics 400).

Prerequisites: Physics 30, Mathematics 30.

Phys 240. (3-3; 3-3)

Mechanics, Heat and Wave Motion—Kinematics, dynamics, translational and rotational motion. Potential, work and energy. Properties of matter; heat, light and propagation of mechanical waves. Kinetic theory of gases and introduction to thermodynamics. Heat conduction and radiation.

Prerequisites: Physics 30, Mathematics 30 and 31.

Corequisite: Mathematics 201 or 207. (Students who lack Mathematics 31 must also take Mathematics 101).

Phys 244. (3-3; 3-3)

Mechanics, Heat and Wave Motion—Kinematics, dynamics, translational and rotational motion. Potential, work and energy. Properties of matter; heat, light and propagation of mechanical waves. Kinetic theory of gases and introduction to thermodynamics. Heat conduction and radiation.

Prerequisites: Physics 30, Mathematics 30 and 31.

Corequisite: Mathematics 206.

Phys 340. (3-3; 3-3)

Light, Electricity and Magnetism—A course designed to follow Physics 240 and to give a foundation in physics suitable for work in other physical sciences. Interference, diffraction and polarization of light. Electrostatics, potential, capacitors, D.C. circuits, magnetism and magnetic field, electromagnetism, induced E.M.F., self-inductance, introduction to alternating currents. Elementary atomic and nuclear physics.

Prerequisites: Physics 240, Mathematics 180 or 201 or 207.

Phys 350. (0-0; 3-0)

Heat and Thermodynamics—Properties of gases, specific and latent heats, thermodynamic equilibrium, ideal and real gases, change of phase, general state functions, entropy, laws of thermodynamics, heat transfer.

Prerequisites: Physics 244 and Mathematics 206.

Phys 370. (3-1s-3; 3-1s-3)

Mechanics, Properties of Matter, Wave Motion, and Optical Phenomena—Conservation laws, central force motion, Rutherford-Bohr atom, kinetic theory of gases, electrical and mechanical oscillations, linear wave motion, elasticity, fluid flow, laws of propagation of light, interference, diffraction and polarization. Laboratory will also include some experiments on heat.

Prerequisites: Physics 244 and Mathematics 206.

Corequisite: Mathematics 306.

Phys 380. (3-3; 3-3)

Electromognetism and Modern Physics—Electrostatics; field and potential theory; DC circuits and instruments; properties of dielectrics and capacitance; inductance; magnetic properties of matter; electromagnetic waves. Interaction of electromagnetic waves and matter, wave aspects of matter.

Prerequisites: Physics 244 and Mathematics 206.

Corequisite: Mathematics 306.

Phys 400. (3-3; 3-3)

The Development of Modern Physics—A study of modern physics, emphasizing the development of current theoretical concepts and modern experimental methods. Topics will include: kinetic theory of matter; electrical conduction, electrons and electron tubes; electrical and neutral particles; radiation and quantum theory; radio-activity and nuclear atomic energy; cosmic rays; relativity.

Prerequisites: Physics 200 or 240 and 340, or 240 and 380; Mathematics 180 or 201.

Phys 416. (2-0; 2-0)

Introduction to Wave Mechanics and Theory of Solids—The Schrodinger equation, quantum statistics, binding forces, electron theory of solids, properties of metals and semi-conductors.

Prerequisites: Physics 330 or Physics 380, Mathematics 303 or Mathematics 306.

Phys 420. (3-3; 3-3)

Introduction to Earth Physics—A course designed to introduce physical methods of studying the solid earth. Elastic waves and gravitation. Physical properties of the earth as indicated by earthquake waves, gravity, paleomagnetic and magnetic and electrical measurements. Principles of geophysical exploration methods. Heat flow in the earth's crust, radio-activity of rocks.

Prerequisite: Physics 340.

Phys 440. (3-3; 3-3)

Electronics—Theory and use of electron tubes and solid state devices, including four-terminal active and passive networks; equivalent circuits, resonant and coupled circuits; filters; amplifiers and oscillators; non-linear circuits; digital and analog circuits.

Prerequisites: Physics 340 or 380, Mathematics 304 or 306.

Phys 468. (0-3; 0-3)

Advanced Laboratory—Methods in experimental atomic physics and spectroscopy.

Corequisite: Physics 474.

Phys 474. (2-0; 2-0)

Relativity and Introduction to Wave Mechanics—Special relativity, wave mechanics; introduction to Schrodinger equation; solutions for plane waves, hydrogen-like atom; vector model of the atom.

Prerequisite: Physics 380.

Prerequisite or corequisite: Mathematics 404 or 421.

Phys 480. (3-3; 3-3)

Electromagnetism—Potential theory; description of electromagnetic field using vector methods; Maxwell's equations; electromagnetic waves in continuous media and in guides; selected topics in electromagnetism.

Prerequisite: Physics 340 or 380.

Prerequisite or corequisite: Mathematics 404 or 421.

Honor and Graduate Courses—

Phys 510. (3-0; 3-0)

Thermodynamics and Kinetic Theory—The statistical basis of thermodynamics is developed. Topics include irreversible processes, Boltzmann, Fermi-Dirac, and Bose-Einstein statistics, phase equilibria, transport phenomena, chemical reactions and fluctuations.

Prerequisites: Physics 350, Mathematics 404, or 421.

Phys 516. (2-0; 2-0)

Introductory Solid State Physics—An introduction to the theory of solids, including a study of the properties of metals, semiconductors and dielectrics.

Prerequisite: Physics 474.

Phys 520. (3-3; 3-3)

Geophysics — Physical structure of the earth. Earthquake and explosion seismology, gravity, heat flow and age determination, tectonophysics. Geomagnetic, paleomagnetic and electromagnetic methods in the study of the earth. Methods of geophysical exploration.

Prerequisite: Mathematics 404 or 421.

Prerequisite or corequisite: Physics 480.

Phys 540. (2-0; 2-0)

Advanced Electronics—Application of complex variable, Fourier series and Laplace transform to the analysis of electronic circuit with linear and nonlinear elements.

Prerequisites: Mathematics 404 or 421, Physics 440.

Phys 550. (2-1; 2-1s)

Mathematical Physics—This course is intended as an introduction to the principal mathematical methods of dealing with the scalar and vector fields of

Physics. Topics include the Sturm-Liouville theory of eigenvalue problems, matrices, partial diffential equations, operational methods and Laplace transforms, Fourier transforms, Green's functions, integral equations and the nonlinear equations of hydrodynamics.

One hour per week will be spent on class discussion of problems.

Prerequisites: Physics 480, Mathematics 404 or 421.

Phys 560. (3-0; 3-0)

Optics and Spectroscopy—An advanced discussion of such properties of electromagnetic radiation as interference, diffraction, polarization and absorption; also interactions of electromagnetic radiation leading to the quantum theory of radiation and a study of radiation emission by atoms and molecules. The current applications of optical spectroscopy will be examined.

Prerequisites: Physics 370 and 480, Mathematics 404 or 421.

Phys 568. (0-4; 0-4)or(0-7; 0-7)

Advanced Laboratory—Methods in experimental atomic physics, spectroscopy and nuclear physics, introduction to modern laboratory techniques. The number of hours required and the experiments assigned depend upon the student's complete fourth year program.

(Restricted to honors students in Science.)

Prerequisites: Physics 474 and Physics 440 or equivalent.

Phys 570. (3-0; 3-0)

Relativity and Quantum Mechanics—Application of quantum mechanics to elementary scattering theory. Perturbation methods. Semi-classical treatment of radiation. Identical particles and spin.

Prerequisites: Physics 480 and 474, Mathematics 404 or 421.

Phys 572. (2-0; 2-0)

Nuclear Physics—Introductory survey of modern experimental and theoretical nuclear physics.

Prerequisite: Physics 474.

Phys 574. (3-0; 3-0)

Radiation Physics—X-rays and radioactivity, with emphasis on their biological effects and medical uses. Production, properties and uses of radioactive isotopes.

Prerequisite: Physics 474 or approval of Department.

Phys 576. (0-0; 3-0)

Reactor Physics—Slowing of neutrons, neutron diffusion theory, the pile equations, critical dimensions for simple pile shapes, the neutron cycle, reactor control, health physics.

Corequisite: Physics 572.

Phys 601. (0-1s; 0-1s)

Seminars in Advanced Topics—Weekly research seminars are held in Theoretical Physics, Nuclear Physics and Low Temperature Physics.

Phys 616. (2-0; 2-0)

Low Temperature Physics

Phys 623. (3-0; 0-0)
Time Sequence Analysis

Phys 624. (0-0; 3-0)
Theoretrical Seismology

Phys 625. (3-0; 0-0)
Geomagnetism and Paleomagnetism

Phys 626. (3-0; 0-0)
Stable and Radioactive Isotope Studies

Phys 627. (3-0; 0-0)
Electromagnetic Boundary Value Problems in Geophysics

Phys 628. (0-0; 3-0)
Topics in Solar-Terrestrial Relationships

Phys 660. (2-0; 2-0)
Atomic Theory and Spectroscopy

Phys 662. (3-0; 3-0)
Molecular Spectroscopy

Phys 672. (3-0; 3-0)
Advanced Nuclear Physics

Phys 674. (3-0; 3-0)
Experimental Topics in Nuclear Physics

Phys 680. (3-0; 3-0)
Advanced Quantum Mechanics

Phys 682. (3-0; 3-0)
Advanced Electromagnetic Theory

Phys 685. (3-0; 3-0)
Advanced Statistical Mechanics

Phys 688. (3-0; 3-0)
Solid State Theory

Phys 690. (3-0; 3-0)
Quantum Field Theory

Phys 691. (3-0; 3-0)
Elementary Particle Physics

Phys 692. (3-0; 3-0)
Group Theory and Applications

Phys 697. (3-0; 3-0)
Nuclear Structure

Phys 698. (2-0; 2-0)
Modern Mathematical Concepts in Contemporary Physics

Phys 699. (2-0; 2-0)
Selected Topics in Theoretical Physics

Phys 788. (3-0; 3-0)
Advanced Topics in Solid State Theory

In consultation with the Department of Physics certain graduate Mathematics courses may be selected as part of a graduate program in Physics.

PHYSIOLOGY

Instruction offered by members of the Department of Physiology, Faculty of Medicine.

Honors in Physiology

The honors program is designed primarily to prepare students for advanced study and research leading to academic and research careers. A choice of options is available for a student with an interest in a particular branch of biology. Since the current trend, emphasized by the majority of graduate departments, is toward quantitative aspects of Physiology, a student is advised to get the best background in mathematics and physical sciences consistent with his interests and abilities.

First Year

Biology 230; Chemistry 230; Mathematics 201, 206, or 180 (with Mathematics 101 if needed); Physics 200, 244, 240 or 100; English 210 or 200; Physical Education.

Second Year

Biology 320; Chemistry 350; Physiology 362; German 210 or Russian 210 or an Arts Option; one of the following: Chemistry 370, Mathematics 304 or 306, or Mathematics 308 with Physics 350, Physics 340 or 380.

Third Year

Chemistry 370 or 372, if not in second year, or Approved Science Option; Biochemistry 300; one course in biology or physiology; one Approved Science Option; one Arts Option; Physiology 600 (Seminar).

Fourth Year

The equivalent of five full courses, selected from Approved Science Options, including at least one full physiology course. In addition, Physiology 401 must be included if not taken in third year. Attendance at seminar (Physiology 600) is required.

Physl 361. (3-3; 3-3)
Elementary Human Physiology—This course comprises the essentials of human physiology, and the laboratory program is designed to illustrate principles of animal function. This course will normally be taken by students in the Faculties of Pharmacy, Arts and Science and Household Economics, but may also be taken by students in other Faculties. Credit must be obtained for laboratory work to allow a passing grade for the course.

Prerequisites: Biology 130 or 230 or Zoology 220 or 225; Chemistry 250 or 350.

Textbooks: Winton and Bayliss, *Human Physiology;* Bell, Davidson and Scarborough, *Textbook of Physiology and Biochemistry,* 5th ed. The latter textbook is strongly recommended for those students proceeding to advanced courses in Physiology and to students registered in Honors programs.

Physl 362. (3-3; 3-3)

Elementary Mammalian Physiology—This course will have the same lecture content as Physiology 361, but the laboratory program involves more detailed and quantitative measurements than Physiology 361.

Offered to selected students in the Faculties of Arts, Science and Graduate Studies.

Prerequisites: Biology 130 or 230 or Zoology 220; Chemistry 250 or 350.

Physl 401. (0-0; 3-3)

Special Mammalian Physiology—A one term course dealing with selected topics in mammalian physiology. The laboratory exercises will provide experience in more advanced physiological methods.

Prerequisites: Physics 200; Physiology 361 or Zoology 440. Alternative qualification may be accepted with consent of Department.

Physl 462. (0-0; 2-3)

Human Neurophysiology—Neurophysiological mechanisms involved in sensation, locomotion and integration of visceral function. The lectures, laboratory and clinical demonstrations will be part of the course for medical students.

Reference Texts: Fulton, *Physiology of the Nervous System;* Sherrington, *Integrative Action of the Nervous System;* Eccles, *The Neurophysiological Basis of Mind;* Eccles, *The Physiology of Nerve Cells;* Walsh, *Physiology of the Nervous System.*

Prerequisites: Physiology 261 or 361 or Zoology 440; Anatomy 415 (Neuroanatomy) is recommended as a co-requisite.

Physl 463. (4-3; 4-6)

Human Physiology—A course designed for students in Honors programs in biological science, similar to Physiology 411, but less extensive in content. It includes a study of the circulatory, digestive and respiratory systems, and the phenomena of digestion, absorption, metabolism and excretion; a study of nerves and synapses, muscle, spinal reflex systems, brain centres and tracts, the special senses, the autonomic nervous system and aspects of behaviour (corresponding to Physiology 462) and a presentation of the principles of action of endocrine glands and detailed treatment of several of these glands. The course content is offered in lectures, demonstrations, laboratory exercises and tutorials. Clinical demonstrations are included.

Prerequisites: Biology 230 or Zoology 220; Chemistry 370 or Zoology 300; Anatomy 415 and Physiology 400, or Zoology 440, recommended but not required.

Textbooks: Bard, *Medical Physiology,* 11th ed.; Lovatt Evans, *Principles of Human Physiology,* 12th ed.; Ruch and Fulton, *Medical Physiology and Biophysics,* 18th ed.

Reference texts: Davson, *Textbook of General Physiology;* Rushmer, *Cardiovascular Dynamics;* Eccles, *The Physiology of Nerve Cells;* Turner, *General Endocrinology,* 3rd ed.

Honor and Graduate Courses

Physl 501. (0-0; 3-0)

Cardiovascular Reflex Activity—Principles of electrophysiological recording from sensory nerves; classical and modern manometry of cardiovascular pressure pulses; nerve receptors in heart and great vessels; cardiovascular effector mechanisms, biophysics of blood vessels; pharmacology of agents acting on the cardiovascular systems; measurement and reflex regulation of the cardiac output; hormonal and central nervous integration of cardiovascular reflexes.

Prerequisites: Physiology 361 and preferably Physiology 463 or 411 (Medical).

Physl 502. (0-3; 0-3)

Problems in Current Research—Students will be assigned according to their interests, to one or more members of staff during the year. They will become familiar with the particular research programmes, the techniques and relevant literature. A critical written report of each programme and its historical background will be submitted by the students.

Physl 504. (3-0; 0-0)

The Physiology of the Adrenal Cortex and the Gonads—A review of the physiology of the vertebrate adrenal cortex including its relationship to the pituitary, a brief consideration of diseases of this gland in man, and of the estimation of its hormones in blood and urine. An introductory review of the physiology of reproduction in mammals and birds followed by detailed consideration of selected problems in endocrine physiology such as functions and control of secretion of prolactin, hormonal control of plumage in birds.

Prerequisites: Physiology 361 or 411 or 463 or Zoology 440; Biochemistry 300 desirable as a prerequisite or co-requisite.

Physl 505. (0-0; 1-6)

Advanced Physiological Techniques—A laboratory course designed to give experience in the use of more elaborate techniques in longer experiments. The student will assemble and test the apparatus for techniques described in the literature; classical as well as modern procedures will be represented.

Prerequisites: Physiology 361 or Physiology 463 or 411 (Medical).

Physl 506. Credit 4 hours

Tutorial and Reading Course—Comprises guided reading in selected topics followed by written and oral presentation of the material covered. Each student will be required to submit review type essays to be analyzed critically by a staff member and to be presented before the group. The course is designed to provide training in analysis, synthesis and communication of scientific material, as well as to allow accumulation of more advanced knowledge.

Prerequisites: Physiology 361 or Physiology 463 or 411 (Medical); at least one of Physiology 501, 503 or 504 or an equivalent course in another department.

Physl 509. (0-0; 3-0)

Advanced Respiratory Physiology—Fundamental aspects of respiratory physiology will be discussed in detail, with special concentration on mechanics of ventilation and gas exchange, and on regulation of respiration.

Prerequisites: An elementary course in physiology plus consent of the instructor. Students should have some knowledge of elementary mathematics and physics.

Physl 600. (1S-0; 1S-0)

Seminar—Lectures on current research in various fields of Physiology and related disciplines.

Prerequisites: Physiology 361 or Physiology 463 or 411 (Medical).

PLANT BIOCHEMISTRY

Instruction offered by members of the Department of Plant Science in the Faculty of Agriculture.

Pl Ph 431. (3-3; 0-0)

Plant Biochemistry—An introduction to plant biochemistry, with consideration of the comparative aspects of biochemistry. Topics include intracellular structure, acidity and colloidal properties of protoplasm, chemistry and metabolism of carbohydrates, including respiration and photosynthesis.

Prerequisites: Chemistry 230 and Chemistry 250 or 350, or consent of the Department.

Pl Ph 432. (0-0; 3-0)

Plant Biochemistry—A continuation of Plant Biochemistry 431, this course deals with the biochemistry of lipids and related plant constituents, and the chemistry and metabolism of nitrogen-containing compounds.

Prerequisite: Plant Biochemistry 431.

Instruction offered by members of the Departments of Botany and Plant Science.

Pl Ph 551. (3-0; 0-0) or (0-0; 3-0)

Advanced Plant Biochemistry

Selected topics in plant metabolism, with emphasis on the comparative biochemistry of respiration and carbon assimilation. Evaluation of recent research and methods of investigation of these fields.

Prerequisites: Biochemistry 300 or Plant Physiology 431 and 432 or consent of Department.

PSYCHOLOGY*

Professors—J. R. Royce (Head), D. E. Smith, W. A. S. Smith, L. von Bertalanffy.
Associate Professors—N. M. Ginsburg, A. J. B. Hough, E. Howarth, T. Nelson, P. P. Rempel, W. N. Runquist, W. W. Rozeboom, Barbara H. Schaeffer, A. L. Schaeffer, D. Spearman, R. G. A. Stretch, P. Swartz, K. V. Wilson.
Assistant Professors—W. Blanchard, B. G. Rule, S. J. Rule, R. E. Walley, T. E. Weckowicz.
Visiting Professors—K. Dabrowski, H. C. Steinmetz.
Sessional Lecturer—C. Larsen.
Sessional Instructor—A. A. Chermes.
Research Associate—A. B. Carran.

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*See also Faculty of Arts Section of this Calendar.

Honors in Psychology

The department offers both the B.A. and B.Sc. degrees with Honors in Psychology. Students wishing to emphasize the Humanities and Social Sciences in their programme should register for the B.A. Those who wish to emphasize the Physical and Biological Sciences should register for the B.Sc.

Honors in Psychology will require six to ten courses in Psychology including the following: Psychology 202, 309; one Science course with lab., one Arts course; and the Honors Seminar 501. The Honors Seminar must be taken each year that the student is in residence in the Honors programme at this University, with the exception of the First Year. A minimum of five courses will be taken in related subjects. The courses in related subjects might be all in one field (e.g., Mathematics or Biology) or in several, depending on the student's special interest and relevance to the subject matter of Psychology.

In addition a minimum of five optional courses will be chosen; some of these will be integrated with the programme in Psychology while others must be general options.

An important feature of the Honors programme includes the opportunity for the student to engage in independent study and research. During the fourth year the student in Psychology will write an Honors thesis under the guidance of a Member of the Department.

In addition to the regular Honors Seminar, all fourth-year Honors students will be required to register in Psychology 600.

Advice to General Program Students

The Department of Psychology offers courses leading to both the B.A. and B.Sc. degrees. Students wishing to emphasize the Humanities and Social Sciences in their programs should register for the B.A. and follow one of the sequences suggested in the Faculty of Arts Calendar. Students wishing to emphasize the Biological Sciences should register for the B.Sc. and follow one of the following sequences:

Three course sequence: Psychology 202 and 309, Psychology 365 or 366 (half courses), and one other senior Psychology course listed in the Faculty of Arts calendar.

Four and five course sequence: Psychology 202, Psychology 309, Psychology 365 and 366 (half courses); one senior Psychology course listed in the Arts calendar; the remainder from senior Psychology listings in the calendar of either Faculty.

NOTE: Since Psychology 309 is prerequisite or corequisite for Psychology 365 and 366 it should be taken in the second year.

Psyco 309. (3-3; 0-0)or(0-0; 3-3)

Statistical Methods for Psychological Research—Application of statistical methods to psychological problems; description of psychological data in terms of averages, measures of variability, and measures of relationships; problems of sampling theory and tests of statistical hypotheses.

Psyco 360. (3-3; 0-0)or(0-0; 3-3)

General Experimental Psychology—A course designed for the arts concentration covering the application of experimental methods to a wide variety of psychological problems.

Prerequisite: Psychology 202.

Corequisite: Psychology 309 or consent of Department.

Psyco 365. (3-3; 0-0)or(0-0; 3-3)

Experimental Psychology: Learning—A basic course covering acquisition, retention and utilization of learned behavior. Laboratory will illustrate methods of studying learning in animals and humans.

Prerequisite: Psychology 202.

Corequisite: Psychology 309 or consent of Department.

Psyco 366. (3-3; 0-0)

Experimental Psychology: Perception—Basic facts of sensory and perceptual phenomena, with focus on vision and hearing.

Prerequisite: Psychology 202.

Corequisite: Psychology 309 or consent of Department.

Psyco 433. (3-0; 0-0)or(0-0; 3-0)

Test Theory—Principles of diagnosis and prediction, and the assessment of tests. Emphasis upon the concepts of "validity" and "reliability" with lesser treatment of multiple regression and factor analysis.

Prerequisite: Psychology 309 or consent of Department.

Psyco 460. (0-0; 0-3)

Experimental Psychology: Apparatus techniques—A laboratory course concerned with training and practical familiarization with commonly used experimental apparatus.

Psyco 464. (2-2; 0-0)

Motor Skills—A basic course covering Reaction Time and Motor Learning; the acquisition and perfection of skills and other factors related to Motor Performance.

Prerequisite: Psychology 202.

Psyco 468. (3-0; 0-0)or(0-0; 3-0)

Motivation—The environmental and physiological activation of animal and human behaviour.

Prerequisite: Psychology 202 and 309.

Psyco 474. (0-0; 3-2)

Comparative Psychology—Principles of animal behavior with reference to phylogenetic differences.

Prerequisite: Psychology 202.

Psyco 475. (3-3; 0-0)

Biological Bases of Behavior—A survey of the anatomical and physiological substrates of behavior, with special emphasis upon sensory systems.

Prerequisites: Biology 130 and Psychology 202.

Psyco 476. (0-0; 3-3)

Physiological Psychology—The physiological correlates of human and animal behaviour with special emphasis upon motivation and learning.

Prerequisites: Psychology 475 or consent of Department.

Honor and Graduate Courses—

Candidates for honors will arrange their courses in consultation with the head of the department.

Psyco 501. (3-0; 3-0)

Honors Seminar—A discussion of current topics in Psychology. Required of all students enrolled in Honors during their second, third, and fourth years.

Psyco 504. (3-3; 0-0)

Conference Course in Psychology

Psyco 505. (0-0; 3-3)

Conference Course in Psychology

Psyco 528. (3-1; 3-1)

Advanced Psychometric Theory—Principles of psychological measurement. Includes such topics as psychophysics, unfolding theory, comparative judgment models.

Prerequisite: Psychology 309 or consent of Department.

Psyco 530. (3-1; 3-1)

Research Design I

Psyco 531. (3-1; 3-1)

Research Design II—A two year sequence required of all graduate students covering methodological techniques and conceptual problems in the design, execution and evalution of psychological research. Includes formulation of hypotheses, selection of experimental conditions, analysis of variance designs, factor analysis.

Psyco 560. (3-0; 3-0)

Advanced Experimental Psychology—A comprehensive survey of fundamental psychological processes emphasizing both major theoretical issues and empirical findings, particularly in learning and perception. Required of all graduate students.

Psyco 565. (3-0; 0-0)or(0-0; 3-0)

Seminar in Learning Theory—Discussion of major theoretical and empirical issues in contemporary learning theory.

Prerequisite: Advanced standing in Psychology.

Psyco 570. (3-0; 0-0)or(0-0; 3-0)

Drugs and Behaviour—Review of the effects of stimulant, depressant, sympathetic, parasympathetic and ataractic drugs on human and animal behaviour.

Prerequisite: Psychology 489, and Psychology 475 or a course in Neuropsychology.

Psyco 575. (3-3; 3-3)
Advanced Physiological Psychology—An intensive survey of methods and problems in Physiological Psychology.
Prerequisite: Physiology 462 or consent of Department.

Psyco 577. (3s-0; 0-0)or(0-0; 3s-0)
Seminar in Physiological Psychology
Prerequisite: Psychology 476 or consent of Department.

Psyco 578. (3-3; 0-0)or(0-0; 3-3)
Experimental Psychopathology—A review of animal and human experimental studies of psychopathology. The course will include studies dealing with the scientific validation of psychoanalytic theory, perceptual studies of psychiatric patients, and experimental attempts to relate psychotherapy and learning theory.
Prerequisite: Psychology 489 and one course in experimental psychology, or consent of the Department.

Psyco 585. (3-0; 0-0)or(0-0; 3-0)
Seminar in Theories of Perception—A theoretical coverage of major issues: classical theories, field theory, sensory-tonic, adaptation level, frame of reference, probabalistic and transactional functionalism, directive state, event-structure, cybernetics and the system viewpoint.
Prerequisite: Psychology 366.

Psyco 599. (3-3; 3-3)
Honors Thesis—Students in their fourth year of honors will pursue a research project under the direction of a member of the department.

Psyco 600. (2s-0; 2s-0)
Research Seminar—Reports by students and staff on current research in the department. Required each year of all graduate students in the Department of Psychology and for fourth year honors students.

Psyco 648. (3-3; 0-0)
Research

Psyco 649. (0-0; 3-3)
Research

Psyco 698. (3-3; 0-0)
Advanced Research

Psyco 699. (0-0; 3-3)
Advanced Research

SOIL SCIENCE

Instruction offered by members of the Department of Soil Science in the Faculty of Agriculture.
Not available for first year students in the Faculties of Arts and Science.

Soils 240. (3-3; 0-0)
Introduction to Soil Science

Soils 250. (0-0; 3-3)

Introduction to Soil Chemistry

Half-year courses in Soil Classification, Soil Microbiology, Soil Colloids, Soil Fertility, and Soil Conservation are also available.

STATISTICS

The program leading to the B.Sc. with Honors in Mathematical Statistics is described in detail in the Mathematics Department section of the calendar.

Stat 241. (0-0; 3-1)

Elementary Probability— Elementary set theory. Finite sample spaces. Probability as a set function. Conditional probability and Bayes' formula. Hypergeometric and binomial distributions. Moments, standardization and the law of large numbers. Density and distribution functions of continuous random variables. Expectation. Poisson and normal approximations of the binomial distribution. Prerequisite: Mathematics 240 or equivalent.

Not available for First Year Students in Arts or Science.

Stat 255. (3-3; 3-3)

Elementary Statistics—Graphs, tables, diagrams. Frequency distributions, averages, dispersion, moments. Elementary probability. Binomial, normal and Poisson distributions. Sampling. Regression and correlation. Significance tests. Applications to data in various fields.

Prerequisite: Mathematics 30.

Stat 256. (3-0; 3-0)

Probability, Statistics, and Numerical Analysis—Probability. Random variables and probability distributions. Binomial, hypergeometric, normal, and Poisson distributions. Estimation, tests of hypotheses. Correlation and regression. Solution of systems of linear equations, inversion of matrices. Polynomial interpolation. Divided and ordinary differences, difference operators. Numerical integration and differentiation. Zeros of functions.

Prerequisite or corequisite: Mathematics 206 and 271, or consent of the Mathematics Department.

Stat 305. (3-2; 0-0) or (0-0; 3-2)

Introductory Statistics—Tabulation, graphical representation and reduction of data. Measures of location and dispersion. Elementary probability. Binomial and normal distributions. Curve fitting and the chi-square test of goodness-of-fit. Elements of sampling. Testing statistical hypotheses, confidence intervals.

Prerequisite: Mathematics 30.

Stat 341. (3-2; 0-0)

Statistical Methods—Joint density and distribution functions. Central limit theorems and sampling distributions. Point and interval estimation. Desirable properties of estimates. Maximum likelihood estimation. Decision theoretic approach to statistical inference. Hypothesis testing as a two-decision problem, likelihood ration, types of errors, power. Linear models: analysis of variance, regression, multiple comparisons, simple designs.

Prerequisite: Statistics 241.

Stat 450. (3-0; 3-0)

Probability and Statistics—Theory of probability. Distribution functions and characteristic functions. Central Limit theorem. Sampling. Exact sampling distributions. Confidence intervals. Maximum likelihood. Method of least squares. Analysis of variance. Statistical inference.

Prerequisites: Mathematics 304 and preferably Statistics 255, or equivalents.

Stat 455. (3-0; 3-0)

Introduction to Mathematical Statistics—Fundamental probability set, algebra of events. Dependence and independence. Random variables and probability distributions. Foundations of Statistical Inference.

Prerequisite: Mathematics 306 and Statistics 256. (With the consent of the Department, Statistics 256 may be waived or Mathematics 306 replaced by Mathematics 304.)

Stat 560. (3-0; 3-0)

Estimation and Statistical Hypotheses—Cramér-Rao inequality; Bhattacharya bounds; sufficiency and completeness; minimax and Bayes estimates based on order statistics.

Neyman-Pearson theory; similar regions; least-favorable distributions; principle of invariance; unbiased tests; non-parametric theory.

Stat 562. (2-0; 2-0)

Theory of Games—Games in normal and extensive form. Methods of solution. Statistical games. Minimax strategies. Bayes procedures. Linear programming.

Stat 564. (3-0; 3-0)

Analysis of Variance—Point estimation. Confidence ellipsoids and tests under normal theory. The one-way layout. Multiple comparisons: the complete two-, three-, and higher-way layouts. Partitioning of a sum of squares. Latin squares. Incomplete blocks and nested designs. The anlaysis of covariance. Random effects models.

Stat 565. (2-0; 3-0)

Mathematical Methods of Statistics—Foundations. Axioms of a probability space. Dependence and independence. Random variables and probability distributions. Characteristic functions. First and second Central limit Theorems. Exact sampling distributions. Regression and correlation. Elements of statistical inference.

Stat 570. (2-0; 2-0)

Probability Theory and Applications—Limit theorems for random variables. Random walks and recurrent events. Applications to Markov chains and selected statistical problems.

Stat 660. (2-0; 2-0)

Stochastic Processes

Stat 674.

Topics in Statistics

Prerequisite: Consent of Department.

ZOOLOGY

Professors—J. R. Nursall (Head), G. O. Mackie, D. M. Ross, L. von Bertalanffy.
Associate Professors—W. A. Fuller, C. P. Hickman, Jr., J. C. Holmes, V. Lewin, R. F. Ruth, A. L. Steiner.
Assistant Professors—D. D. Beatty, D. A. Boag, H. F. Clifford, R. C. Fox, J. S. Hayward, Jean K. Lauber, Sara E. Zalik.
Sessional Lecturers—Betty N. Daniel, Ruth Schachter.
Visiting Professor—J. A. Serra.
Honorary Research Associate—J. Dewey Soper.

Honors in Zoology

The Honors program provides a comprehensive training in Zoology leading to higher degrees and a research or academic career. It requires a minimum of eight courses in Zoology, two of which are half-year, field-oriented courses. Certain ancillary subjects are required and other ancillary subjects may be taken as "approved options". Students are required to take the Zoology field course (Zoology 525) in the third and fourth years, to attend the Zoology Seminar (Zoology 520) in the fourth year and to undergo a comprehensive oral examination on basic biological facts and principles at the end of the fourth year. Honors students are often employed on biological work during the summers.

First Year

English 200 or 210; Biology 130 or 230*; Arts option (modern language of matriculation recommended); Chemistry 130 or 230; Physics 100 or 200; Physical Education.

Second Year

Zoology 300 and 350; Arts option; Chemistry 350; Genetics 351.

Third and Fourth Years

Five senior courses in Zoology, including Zoology 411, 440, 481 and two of Zoology 406, 408, 452, 462, 464, 465 and 471; four approved options; one open option.

Honors in Geology and Zoology

See under Department of Geology

Advice to General Program Students

Students intending Zoology as a subject of concentration should take Biology 30 and Chemistry 30 of matriculation.

Students lacking Biology 30 should enter Biology 130 in University in their first year, proceed to Biology 230 in second year and in third year take Zoology 320 and 350.

Students entering University with Biology 30 should register in Biology 230 in their first year, in order to take one or both of Zoology 320 and 350 in their second year. In their third year, further courses in Zoology will be open to them.

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*Students without Biology 30 are required to take Biology 130; students with Biology 30 may proceed to more advanced courses with consent of department.

The recommended first year should include Biology 230, Chemistry 230 and Physics 100 or 200.

A general program student with a three or four course concentration in zoology can undertake graduate work only by spending a year as a special student after taking a B.Sc. A five course concentration with suitable ancillary subjects might be sufficient background for graduate work. If an undergraduate in the General Program forms a desire to do graduate work in zoology he should consult the Department for advice on the best combination of courses in the final years of his General degree program.

Junior Courses—

(See courses listed under Biology.)

Senior Courses—

Zool 300. (3-3; 3-3)

The Chordates—A comparative review of the chordates, with dissections of available types from all classes.

Prerequisite: Biology 230 or consent of Department.

Zool 320. (2-4; 2-4)

Vertebrate Biology—A general survey of structure and functions of vertebrate animals.

Prerequisite: Biology 230 or consent of Department.

Zool 321. (0-0; 3-0)

Animal Geography—An outline of the distribution of the major groups of animals in time and space, together with a presentation of ecological and geological theories to explain the observed distributions.

Normally to be taken in sequence with Botany 321. Not open to honors students in Zoology.

Prerequisites: Any two of Botany 201, Geography 201 or Biology 230 or consent of Department.

Zool 350. (3-3; 3-3)

The Invertebrates—A survey of the invertebrates with emphasis on functional anatomy.

Prerequisite: Biology 230 or consent of Department.

Zool 404. (3-3; 0-0)

Ichthyology and Herpetology—Systematics of fish, amphibians and reptiles, with emphasis on Alberta forms. Attention will be given to recent environmental, physiological and behavioral studies and their application to the systematics of these groups. Techniques of collection, preservation, identification and preparation will be applied.

Prerequisite: Zoology 300 or 320.

Zool 405. (0-0; 3-3)

Ornithology—Origin, distribution, anatomy, taxonomy, behavior and ecology of the birds of the world, with emphasis on the birds of Alberta.

Prerequisite: Zoology 300 or 320.

Zool 408. (3-3; 0-0)

Mammalogy—Origin, relationships and structure of mammals. A survey of the families of living mammals; past and present distribution of important groups; recognition and life histories of Alberta forms.

Prerequisite: Zoology 300 or 320.

Zool 411. (3-3; 0-0)

Embryology—The sequence of normal development is presented and the underlying mechanisms are analyzed.

Prerequisite: Zoology 300 or 320 or consent of Department.

Zool 412. (0-0; 3-3)

Experimental Embryology—The classical and modern experiments which have made embryology an experimental subject are presented and some of them are tested.

Prerequisite: Zoology 411 or consent of Department.

Zool 421. (0-0; 3-0)

Mechanisms of Evolution—Selected topics dealing chiefly with current concepts of organic evolution.

Prerequisites: A biology course at the 300 level. It is strongly advised that Zoology 421 be preceded in the first term by Genetics 481 or 483.

(Not offered in 1966-67)

Zool 440. (3-3; 3-3)

Comparative Animal Physiology — Organization and diversity of animal functions; nervous and endocrine integration; metabolism; reproduction, growth and metamorphosis.

Prerequisite: Zoology 300, 350 and Chemistry 250 or 350. Zoology 350 may be taken as a corequisite with the department's permission.

Zool 451. (0-0; 3-3)

Aquatic Invertebrates of Alberta—A seminar and special projects course with emphasis on groups other than insects.

Prerequisite: Zoology 350.

Zool 452. (0-0; 3-3)

Principles of Parasitism—Host and parasite adaptations; relationships with other forms of symbiosis; effect of parasitism on the host and the parasite; parasitism and disease.

Prerequisite: Zoology 350, 462. Zoology 350 may be taken as a corequisite with the department's permission.

Zool 462. (3-3; 0-0)

Animal Ecology—The ecological principles governing the reciprocal relationships between animals and their environments.

Prerequisites: Biology 230 and a senior course in Zoology or consent of Department.

Zool 464. (3-3; 0-0)

Limnology—Physical and chemical characteristics of lakes; qualitative and quantitative techniques for determination of planktonic, benthic and fish production; principles of lake management.

Prerequisites: Zoology 300 or 320 and 350.

Zool 465. (0-0; 3-3)

Boreal Ecology—A study of the animals of the cold temperate, subarctic and arctic regions and in the adaptations that enable them to survive in those regions.

Prerequisite: Zoology 462.

Zool 471. (3-0; 0-0)

Animal Behavior—Behavior as an adaptive phenomenon. The genetic, anatomical, neurological and hormonal bases of behavior. The structure of animal societies. The systematic, ecologic and evolutionary significance of behavior.

Prerequisite or Corequisite: Zoology 300 or 320, or consent of Department.

Zool 481. (0-0; 3-3)

Practical Histology—Principles and practice of microscopy, tissue preparation techniques, micrometry and photomicrography. Principles of biological structure. Study of tissues.

Prerequisites: Zoology 300 or 320 and 350, Chemistry 250 or 350.

Honor and Graduate Courses—

Zool 515. (3-0; 3-0)

Introduction to Mathematical Biology—Fundamentals of logic, sets, combinations and permutations, probability, vectors, matrices and stochastics; restricted to finite, discrete cases. Mathematical models of various biological phenomena such as genetic coding, nerve nets, social organization, kinship relations, fertility and so forth.

Prerequisite: Biology 230 or consent of Department.

Not ordinarily open for credit to students who have taken Math. 270.

(Not offered in 1966-67)

Zool 516. (2-0; 2-0)

Mathematical Models of Animal Social Behavior—A seminar course, designed to acquaint students in psychology, sociology, mathematics and zoology with recent work on formal models of social phenomena, and to point out promising areas for further empirical and mathematical research.

Prerequisites: Zoology 515 or consent of Department.

(Not offered in 1966-67)

Zool 520. (1s-0; 1s-0)

Seminar in Zoology—Reports by members of staff, graduate students and invited speakers, on research in progress or on recent advances in Zoology. Required of all fourth year honors and graduate students.

Zool 525.

Field Course in Zoology—A survey of the terrestrial and freshwater fauna of Alberta alternates yearly with a survey of the marine and littoral fauna

of part of the Pacific coast. The course lasts two weeks and follows the spring examination. Both parts are required for the Honors B.Sc. in Zoology and should be taken in the third and fourth years.

Zool 529. (3 hours either or both terms)
Special Problems in Zoology

Zool 540. (2-5; 0-5)
Environmental Physiology—A seminar and special research project course dealing with principles of physiological adaptation of animals to environmental variation.

Prerequisites: Zoology 440 or Physiology 361, or consent of Department.
(Not offered in 1966-67)

Zool 541. (2-0; 0-0)
Seminar in Environmental Physiology—The lecture and seminar content of Zoology 540.

Prerequisite: Zoology 440 or Physiology 361, or consent of Department.

Zool 542. (2-0; 2-0)
Seminar in Comparative Animal Physiology—A seminar dealing with recent advances in comparative animal physiology.

Prerequisites: Zoology 440 or Physiology 361 or Entomology 556 or consent of Department.
(Not offered in 1966-67)

Zool 555. (3-3; 0-0)
Wildlife Parasitology — Morphology, life cycles, pathology and control of animal parasites of fish, birds and mammals, with special reference to forms found in Alberta game.

Prerequisite: Zoology 462 or consent of Department.

Zool 556. (1-5; 1-5)
Helminthology—Taxonomy, morphology and ecology of the parasitic helminths.

Prerequisite: Zoology 452 or consent of Department.
(Not offered in 1966-67)

Zool 562. (1-0; 1-0)
Conservation Topics—A reading and seminar course designed to cover biological conservation as practised in North America.

Zool 563. (0-0; 1-5)
Population Ecology—Estimation of energy flow in, attributes of, and relationships between populations. Both laboratory and field populations to be considered.

Prerequisites: Zoology 462 or Botany 422 or Entomology 560.

Zool 565. (3-3; 3-3)
Principles of Conservation and Wildlife Management—Management of upland and migratory game birds, big game and fur-bearing mammals; discussion

of legal aspects of conservation and the role of sanctuaries, National Parks and wilderness areas.

Prerequisites: Zoology 406, 408. These may be taken as corequisites with permission of Department.

(Not offered in 1966-67)

Zool 571. (0-0; 3-0)

Animal Behavior—Advanced problems and recent research in animal behavior with particular emphasis on the social behavior of vertebrates.

Prerequisite: Zoology 471 or consent of Department.

(Not offered in 1966-67)

Zool 582. (0-0; 3-0)

Advanced Histology—A seminar and project course for students intending to employ histological methods extensively in graduate research.

Prerequisite: Zoology 481 or consent of Department.

(Not offered in 1966-67)

Zool 620. (Seminar 0-0; 3-0)

Selected Topics of Modern Biology—The seminar is intended to give graduate students an immediate contact with modern research activities and problems. Questions and fields will be discussed which are in the focus of research and theory, so far as possible by workers active in the fields concerned. Emphasis will not be on data presentation, but rather on free discussion of important topics, their interrelationships, even their bearing on problems of our time. The participants will be free to ask for topics where they wish further information or are particularly interested.

Prerequisite: Consent of Department.

Paleontology

Paleo 518. (3-3; 0-0)

Paleontology of the Lower Vertebrates—The origin, classification, evolution and historical distribution of the fishes, amphibians, reptiles and birds.

Prerequisite: Consent of Department.

Paleo 519. (0-0; 3-3)

Paleontology of the Higher Vertebrates—The origin, classification, evolution and historical distribution of the mammals; particular emphasis on the fossil history of the carnivores and "ungulates".

Prerequisite: Consent of Department.

Paleo 620. (1-0; 1-0)

Problems in Vertebrate Paleontology—A seminar course dealing with specific topics of current research interest in vertebrate paleontology.

Prerequisites: Paleontology 518, 519.

XXII

The Faculty of Graduate Studies

THE FACULTY OF GRADUATE STUDIES

Graduate work has been offered at the University of Alberta since its inception in 1908. During recent years the numbers of graduate students have increased rapidly, particularly in the programs leading to doctoral degrees. The present organization of the Faculty with a Dean was adopted in 1957.

The degrees offered by the Faculty are the Master of Arts, Master of Business Administration, Master of Education, Master of Laws, Master of Science, Doctor of Education and Doctor of Philosophy. All of these are based on programs of study including a thesis project. The Doctor of Letters and Doctor of Science degrees are awarded for outstanding achievement in the humantiies or sciences. In 1965 the degrees awarded included 60 M.A., 60 M.Ed., 138 M.Sc., and 62 Ph.D. There were 1,563 students registered in the Faculty in 1965-66 including 1,403 in the Winter Session.

The University has continually expanding facilities for advanced study and research, and a steadily growing staff to provide direction in graduate programs.

PROGRAMS IN THE FACULTY OF GRADUATE STUDIES

The Faculty of Graduate Studies administers programs leading to the degrees of Master of Arts, Master of Business Administration, Master of Education, Master of Laws, Master of Science, Doctor of Education, and Doctor of Philosophy, and makes recommendations for granting the degrees of Doctor of Science and Doctor of Letters.

Graduate students are admitted to the Faculty in one of the following categories:

1. *Candidate for a master's degree.*
2. *Provisional candidate for a doctor's degree*:
   All Ph.D. and Ed.D. students are admitted as provisional candidates. (See special regulations under Doctor of Philosophy)
3. *Probationary graduate student* is one whose university record is either: (a) difficult to assess (e.g. some foreign students) or (b) below the standard normally required.
4. *Conditional graduate student* is one who is required to take undergraduate courses prerequisite to, and in addition to, the graduate program. Fees for such courses are additional to graduate program fees.
5. *Special graduate student* is one who wishes to take graduate courses for purposes other than degree credit at this university.

Beginning in September, 1967, graduates of the University of Alberta with three-year B.A. and B.Sc. degrees will be admitted to a Qualifying Year rather than as candidates for a master's degree. Graduates of other institutions with similar qualifications will be admitted on the same basis.

The Faculty of Graduate Studies is administered by a Dean and a Council representative of the departments offering graduate work. Inquiries should be addressed to the Dean, Faculty of Graduate Studies.

The general regulations apply to all graduate students. Additional requirements are outlined under the headings: "Master's Degree", "The Degree of Doctor of Philosophy", "The Degree of Doctor of Education", and "The Degrees of Doctor of Science and Doctor of Letters".

GENERAL REGULATIONS

Qualifications for Admission

The requirements for admission to the Faculty are:

(a) a baccalaureate degree with an average mark of at least 65% (University of Alberta basis) in the work of the last two undergraduate years or the equivalent, and

(b) a statement from the head of the department concerned to the effect that the applicant is, in all respects, acceptable to the department.

Applicants should recognize that graduate work differs from undergraduate study in that it requires, in addition to formal course work, initiative and persistent industry directed toward a research project.

After the completion of one academic year (i.e. one complete winter session) a probationary graduate student who has proven his competence to the satisfaction of the department and the Faculty, may be accepted as a candidate for a master's degree or as a provisional candidate for a doctor's degree. If accepted, he may apply to the Faculty to have courses completed during his status as a probationary graduate student credited toward the requirement for a degree. Each such application will be considered on its individual merits. Special graduate students are not considered as candidates or potential candidates for a degree and do not require a departmental recommendation.

Application for Admission

Applications for admission to the Faculty must be submitted on forms supplied by the Dean. No assurance can be given that applications received after August 31 (for the winter session) or April 1 (for the summer session) can be processed in time to permit registration. A graduate of another university must arrange with the Registrar of that institution to forward two transcripts of his academic record to the Dean prior to August 31 or April 1. The Dean may require the applicant to furnish an official description of the content of the courses listed on the transcripts.

Registration

An applicant accepted by the Faculty as a candidate for a Master's degree, as a provisional candidate for the Doctor of Philosophy degree or the Doctor of Education degree, as a "probationary graduate student", or as a "conditional graduate student", is required:

(a) to register not later than September 22 if he proposes to work on his program during the winter session (departmental approval of Program Form should be obtained during the preceding week); or not later than May 2 if he proposes to work on his program in the summer session;

(b) if he registers later, to pay a late registration fee for the winter session of $3.00 and an additional $1.00 per day for each day by which the registration is postponed beyond September 26.

(c) to maintain continuous registration during his program by registering once a year (see Note below);

(d) to present with each registration a program of studies signed by the head of the department responsible for his graduate study program. Program forms may be obtained from the office of the Dean or the Department.

NOTE:—

All students on graduate degree programs must register once a year in order to keep their programs active. This registration entitles students to the use of university facilities and to assistance from their supervisors for a 12-month period. Registration during the final year of the program permits the student to graduate at either of the two following Convocations.

A student who fails to maintain continuous registration will be considered to have withdrawn from his program. If he wishes to resume studies on the program, he must apply for readmission to the Faculty of Graduate Studies and have his program reassessed in terms of the regulations in force at the time of reapplication. If he is recommended for re-admission, a re-admission fee of $50.00 will be charged in addition to the fees assessed in the regular manner.

Academic Standards

In any course taken for credit toward an advanced degree the pass mark is 65%. (Under the new grading system, a grade point of 6 is required.) No supplemental examinations are permitted. If, after consulting the department and any committee concerned, the Faculty decides that a candidate is not making satisfactory progress *in either course work or research* the candidate may be required to withdraw.

Intersession Registration

Graduate students who are working full-time on their graduate programs during part or all of the period May to September are encouraged to complete "Intersession Registration". Those holding University Awards during this period must register. Full residence credit is given for this period if the student is registered. There is no fee. Students who register for the Summer Session do not receive Intersession credit for the period of the Session.

Time Limit

To be recommended for a degree a candidate must complete all of the requirements within six years of the time he is first registered for graduate study.

Thesis and Oral Examination

A candidate for a Master's or a Doctor's degree is required to submit a thesis and pass an oral examination. For purposes of spring graduation, a candidate is required to submit his thesis by April 13 and to have it approved and to pass the oral examination not later than April 28. The corresponding dates for fall graduation are October 3 and October 20, 1966. The thesis must be submitted to the department at least two weeks prior to the date of the oral examination. Failure to meet either of these deadlines will automatically delay graduation

unless special arrangements are made through the Dean. The bound thesis must be in the Faculty office by the date of the May or October meeting of the Council of the Faculty of Graduate Studies.

Thesis Regulations

Number and Distribution of Copies

The student shall prepare at least five copies of his thesis, as follows:

1. The *original*, to be deposited in the office of the Faculty of Graduate Studies. This becomes the library copy after it has been examined by the Faculty. The members of the examining committee must sign this copy *directly in ink.*
2, 3. To be retained by the Department, or (if the Faculty has its own library) to become the library and the Department copy, respectively. One of these copies will be available for inter-library loan.
4. To be retained by the student.
5. To be retained by the supervisor. With the Department's permission this requirement may be waived.

Further copies may be required in special cases. For example, a student who holds a fellowship or financial assistance donated by a private individual or a company may be expected to provide a copy for the donor. If multiple copies are prepared and one of these submitted as the original, only the multilith process may be used without special permission from the Faculty of Graduate Studies.

Typing

Any standard type is acceptable but one size and style must be used consistently throughout the thesis. Electric typewriters generally produce the best copies.

Binding

All copies should be bound in buckram (the color to be determined by the supervising Department) with a short title and author's name printed in gold on the spine. Official copies (Nos. 1-3) *must* be so bound and lettered.

Paper

Regulation bond, 8 1/2" x 11" (16 lb. weight, Bellfast, or equivalent quality, for the initial copy, other copies may be on 13 lb. bond.) One type of paper must be used throughout a given thesis except for charts and figures. With special permission and in special cases, 14" paper may be used. A photographic process is acceptable for charts and diagrams.

Margins

A minimum left margin of 1½ inches is required. Other margins should be at least 1 inch.

Order of Items

1. Title page.
2. Approval sheet (including, if desired, an indication of the weight of the thesis in the student's total program).
3. Abstract (not more than two pages).

4. Acknowledgments, if any.
5. Table of Contents (listing chapter heads and subheads, biblography and appendix, if any).
6. List of Tables, if any.
7. List of Figures or Illustrations, if any.
8. Body of text.
9. Bibliography or references.
10. Appendix, if any.

General Form and Style

This may differ somewhat from Department to Department. The main point is consistency of form, tone, and level in a given thesis. It is recommended that students consult a manual on thesis writing that has been approved by their department.

Writers may use either footnotes or keyed bibliography, or both. Footnotes may be placed either at the foot of the page, or in a group at the end of the chapter or thesis—at the option of the supervising department.

General

University copies of theses are available in the Reference Room of the University Library. All students are requested to look at appropriate examples, and to consult their supervisor or Department Head, before commencing preparation of their theses. Samples of the title page and of the approval sheet are available in the office of the Faculty of Graduate Studies.

SPECIAL REGULATIONS

THE MASTER'S DEGREE

1. Full-time attendance at classes or activity in research or both for a minimum period of one academic year at the University, while registered as a graduate student, is required for a Master's degree. An alternative proposal may be considered if recommended by the department.
2. A candidate entering the Faculty from a four-year specialized program and continuing work in the same field is normally required to complete the equivalent of one calendar year's work. Other candidates are normally required to complete the equivalent of two years' work. Details are determined by the department.
3. Considerable variation is permitted in the balance between the research and courses required for the degree. All candidates must include some course work in the program, and proposals involving research work equivalent to less than two full courses, require Faculty approval.
4. Some summer session and evening courses may be accepted in a Master's degree program, but no more than three may be taken in any twelve-month period without approval of the Dean. Only under special circumstances, and with approval of the departments involved, will extramural courses be accepted for credit.

5. The results of research must be submitted in the form of a thesis conforming to the Faculty regulations.
6. An examining committee of at least three faculty members, one from a department other than that in which the student is registered, must be approved by the Faculty. The committee reviews the thesis and conducts an oral examination designed to test the candidate's knowledge of the thesis subject matter and of related fields. Persons other than the examiners may attend with the approval of the Dean or the chairman of the committee.

THE DEGREE OF DOCTOR OF PHILOSOPHY

1. A student may be admitted as a provisional candidate for the degree of Doctor of Philosophy if he holds a bachelor's or a master's degree, or their equivalent, from an approved university. Admission is contingent upon recommendation by a department and upon the availability of suitable courses of study, library, laboratory and other facilities. The student will remain as a provisional candidate until he has successfully completed his candidacy examination (see section 6 below).
2. The essential factor in the requirements for the doctorate is the demonstration of ability to plan and carry out research of a high calibre leading to an advance in knowledge in the student's major field of study.
3. The time necessary to complete the requirements for the doctorate depends upon the student's progress. For a student with a bachelor's degree the minimum requirement is three academic years of study and research, of which two academic years must be in residence at the University of Alberta. For a student with a master's degree the minimum requirement is two academic years of study and research in residence at the University of Alberta. An alternative method of meeting the residence requirement may be considered on recommendation to the Faculty of Graduate Studies by the department concerned.
4. The student's program shall be under the direction of a committee of not fewer than three members appointed by the Faculty of Graduate Studies. The chairman of the committee shall be the faculty member under whose supervision the student is carrying out his major research. Where appropriate, one or more members of the committee shall be chosen from a department other than that in which the major research is being carried out. The committee shall recommend to the Faculty of Graduate Studies a program of research. The same committee shall arrange for the necessary examinations and for adjudication of the thesis.
5. Before the student takes his candidacy examination, he shall satisfy his committee that he possesses a knowledge of one of French, German or Russian sufficient for the reading of publications in this language. Departments may demand proficiency in such additional languages as are necessary. Students should check departmental requirements.
6. At least six months before he takes his final examination, the student shall pass a candidacy examination in subjects relevant to the general field of his research, and such other examinations as may be required by his department. Normally an oral examination is required, and will be held when the course work is generally completed and the thesis project well started. The

examination shall be under the direction of the supervisory committee to which two other members of the teaching staff have been added. At least one member of the examining committee shall be a person from a department and discipline other than that in which the major research is being carried out. Persons other than the examiners may attend only by agreement with the Dean of the Faculty of Graduate Studies or the chairman of the Committee.

7. The results of the candidate's research shall be presented in a thesis satisfying the general requirements of the Faculty of Graduate Studies. The material must be of sufficient merit to meet the standards of reputable scholarly publications.
8. The thesis shall be approved by an examining committee which will consist of the supervisory committee and at least two other examiners, one of whom shall be an external examiner who is a recognized authority in the special field of research. A final oral examination, based largely on the thesis, shall be conducted by the examining committee. Persons other than members of the Graduate Faculty Council or members of the staff of the major department may attend by agreement with the Dean of the Faculty of Graduate Studies.

THE DEGREE OF DOCTOR OF EDUCATION

The degree of Doctor of Education attests proficiency in a program of graduate study in which the emphasis is upon preparation for competent professional performance. The general regulations with respect to admission, residence requirements, candidacy examinations and final examinations for the Ed.D. degree are the same as those listed for the Ph.D. degree with the following exceptions:

(1) Several years of successful teaching and an M.Ed. degree or its equivalent are prerequisites for admission.
(2) A reading knowledge of French is required. Under special circumstances another language may be substituted.
(3) The program emphasizes breadth in educational theory, practice and research rather than intensive specialization in a particular area.
(4) The student's program may make provision for supervised field experiences.

THE DEGREES OF DOCTOR OF SCIENCE AND DOCTOR OF LETTERS

The degree of Doctor of Science (D.Sc.) or of Doctor of Letters (D.Litt.) may be conferred on persons considered by the General Faculty Council to have distinguished themselves by special research or learning in the respective domains of science and of the humanities or social sciences, subject to the following regulation:

1. The degrees of Doctor of Science and of Doctor of Letters are awarded exclusively on the basis of original work of merit carried out by the candidate, either individually or in cooperation with others. In the case of an application based upon cooperative work, the candidates shall submit a written statement indicating the share he personally has taken in the work.

A reasonable proportion of the work must have been carried out at the University of Alberta.

2. Application must be made in writing to the Dean of the Faculty of Graduate Studies and should be accompanied by four reprints of all papers and by at least one copy of each book submitted by the candidate. The application, accompanied by the proper fee, must be submitted before the first day of November of the academic year in which it is proposed to take the degree.

PROGRAMS OF STUDY

This section contains alphabetically, according to departments, brief descriptive paragraphs which outline the departmental facilities, the fields of research and special interests, and special departmental regulations together with titles of graduate courses offered by the departments. **Further information on courses, both graduate and undergraduate, will be found in the calendar of the appropriate Faculty or School.**

NOTE: In the case of courses in which the weekly hours of instruction are fixed, these are set out for both terms of the winter session. The letter "s" attached to a figure signifies seminar-hours, the letter "a" hours allotted to assignments or discussion of assignments, the letter "L" lecture-laboratory and the letter "P" hours devoted to a project. Otherwise, the first figure in each term indicates lecture-hours and the second laboratory-hours.

AGRICULTURAL ECONOMICS

1. The Department offers a program of course work and research leading to the Master of Science degree.
2. Thesis research may be carried out in various fields of Agricultural Economics, including agricultural business management, rural social and economic development, finance, human resources, international commodity trade, land and water resources, marketing, policy, prices, and production economics.
3. A student who does not meet all of the Department's undergraduate requirements may be admitted on a conditional or probationary basis. All deficiencies must be removed before a student can become a candidate for the Master's degree. The undergraduate requirements include (on a full course or equivalent basis): one mathematics course, one statistics course, two economic theory courses, three agricultural economics courses, and one related social science course, with an average of 70 percent or more in such courses (80 percent or B+ is required for students from most foreign universities).
4. A candidate is expected to take a minimum of four graduate courses (at least one of which must be in a related field) in addition to the thesis and after removal of any undergraduate deficiencies. Approved 400-level courses may be taken as **part** of the graduate course program.
5. A candidate with a high scholastic standing and no undergraduate deficiencies may complete a Master's program in 12 months but most students will require two years of graduate study to meet the requirements for the Master's degree.
6. A number of teaching, service, and research assistantships are available for well qualified applicants. Students with teaching or service assistantships should expect to take more time to complete their graduate programs.
7. Inquiries concerning programs and assistantships should be directed to the Head of the Department.

8. *Undergraduate courses* which may be taken for graduate credit:

Agricultural Economics

415. Analytical Methods in Agricultural Economics	(3-3; 0-0)
422. Managerial Economics for Agricultural Businesses	(3-0; 0-0)
423. Management Techniques in Agriculture	(0-0; 3-0)
453. Land Economics	(0-0; 3-0)
473. Agricultural Policy	(3-0; 0-0) or (0-0; 3-0)
493. Agricultural Growth and Adjustment	(3-0; 0-0) or (0-0; 3-0)

Rural Sociology

456. Rural Social Problems and Public Policy	(3-0; 0-0) or (0-0; 3-0)
458. Agrarian Social Movements	(0-0; 3-0) or (3-0; 0-0)

9. *Graduate courses*:

500. Research Projects in Agricultural Economics	
516. Analytical Techniques	(3-3; 0-0) or (0-0; 3-3)
533. Production Economics	(3-0; 0-0) or (0-0; 3-0)
553. Economics of Land Use and Conservation	(3-0; 0-0) or (0-0; 3-0)
563. Market Structure and Behavior	(3-0; 0-0) or (0-0; 3-0)
583. Price Analysis and Forecasting	(3-2; 0-0) or (0-0; 3-2)
601. Agricultural Economics Seminar	(1s-0; 1s-0)
613. Research Methods	(3-0; 0-0) or (0-0; 3-0)
633. Resource Efficiency and Allocation	(3-0; 0-0) or (0-0; 3-0)
663. Market Performance	(3-0; 0-0) or (0-0; 3-0)
673. Topics in Agricultural Economics	(3-0; 0-0) or (0-0; 3-0)

AGRICULTURAL ENGINEERING

1. Graduate work leading to the degree of Master of Science may be undertaken in the Department of Agricultural Engineering with the major field of study in Agricultural Mechanization.

2. Course work and graduate research is directed towards developing competence in the quantitative economic approach to the mechanization of farms and ranches, rather than towards the mechanical design of agricultural equipment. Required courses include Statistics, Numerical Analysis, Production, and a graduate course in Operations Research offered by the Department of Agricultural Engineering. Research work leading to the preparation of a thesis is generally related to a quantitative assessment of the level of mechanization of some phase of Western Canadian agriculture. In particular cases, graduate students may select some phase of irrigation for investigation, in which case they will conduct part of their research at the Lethbridge Research Station..

3. Funds are available for one or two graduate students to be engaged by the Department of Agricultural Engineering as Research assistants. Such students should expect to take an extra year to complete the requirements for the Master of Science degree.

4. *Graduate Courses*

600. Agricultural Engineering Seminar (1S-0; 1S-0)

601. Operations Research (3-3; 3-3)
The application of statistical and mathematical techniques to selected problems in Agricultural Mechanization.

ANATOMY

Laboratory accommodation for a small number of graduate students is open to Arts and Science graduates and to medical students and graduates who wish to spend a year out of course doing advanced work in medical sciences. Application should be made as early as possible in the year preceding that in which the student plans to work.

Graduate Courses

601. Histology/Cytology (2-4; 2-4)

602. Developmental Anatomy (2-4; 0-0)

603. Physical Anthropology (0-0; 2-2)

604. Advanced Neuroanatomy (2-2; 2-2)

ANIMAL SCIENCE

1. Graduate study may be undertaken in genetics, nutrition or physiology in either the Animal or the Poultry Science division of the Department. A well-equipped chemical laboratory is maintained for research purposes.
2. Information regarding assistantships and other forms of financial assistance currently available to students registered in programs for the M.Sc. or Ph.D. degree will be supplied upon request; address inquiries to the head of the Department.
3. The time required to complete a Master's program varies according to the undergraduate training of the student and the nature of the research undertaken. Normally two academic years of course work and research plus one summer of research, or one academic year and two summers, are needed to complete the requirements.
4. Normally M.Sc. students are required to complete two of the Animal Science graduate courses listed below plus at least two approved courses selected from the following areas: Biochemistry, Biometrics, Chemistry, Genetics, Mathematics, Physiology and Zoology.
5. Courses for Ph.D. students are selected according to the background and interests of the candidate.
6. *Graduate Courses*

Animal Science

501. Research Projects Max. of 6 hrs. credit

512. Advanced Nutrition—Staff (3-3; 3-0)

580. Biometrical Techniques in Animal Improvement (0-3L; 0-0)
R. T. Berg

600. Seminar—Staff (1s-0; 1s-0)

680. Procedures in Quantitative Animal Genetics (0-0; 2-4)
R. T. Hardin

BACTERIOLOGY

The Department offers facilities and supervision for studies leading to Master of Science degree in a wide area of medical microbiology; including immunology, virology, public health, mycology, infectious disease, laboratory medicine, epidemiology of major diseases and zoonoses. By arrangement with other departments such as Biochemistry, Botany, Zoology, Genetics, Soil Science, Pathology and the clinical departments within the Faculties of Medicine, Dentistry and School of Nursing, programmes of study from practically every aspect of medical microbiology can be arranged, and approach can be fundamental, clinical or technical.

Course requirements will depend upon a student's background but usually at least two graduate courses offered by this Department, the Department of Microbiology and/or other approved graduate courses will be required. All graduate programmes must be approved by the Head of the Department.

Graduate Courses

501. Bacteriology—Members of the Departments
A directed studies programme of reading and supervised experiments.

504. Medical Mycology—J. W. Carmichael (0-0; 0-6L)or(0-3L; 0-0)
A study of the fungi which cause disease in man; methods for their demonstration, isolation and identification. Some attention will also be given to the epidemiology, serology and pathology of fungus diseases.
Prerequisites: Bacteriology 361 or Bacteriology 421 and permission of Head of Department.

BIOCHEMISTRY

1. The Department offers a program of course work and research leading to the degree of M.Sc. or Ph.D. Prospective candidates should consult the head of the Department regarding research facilities and course requirements. Teaching assistantships and demonstratorships are often available, as well as financial assistance from research grants to faculty members. Application for financial assistance should be made, if possible, by December of the year previous to that in which the student wishes to begin graduate work. Availability of funds is usually made known by April.
2. The staff of the Biochemistry Department is currently carrying out research in the following fields: cell-virus interactions and mechanisms of viral replication; chemical, physical and biological properties of the nucleic acids; physico-chemical and enzymatic properties of muscle proteins; chemical and physical properties of the proteolytic zymogens and enzymes; the effects of inhibitors, activators and protein reagents on the enzymatic and physiochemical properties of glycogen phosphorylase and other sulfhydryl enzymes; the biological control of glycogen metabolism; oxidation-reduction processes in reactions catalyzed by peroxidases and catalases; chemistry of mammalian erythrocytes; metabolism of purines and purine analogs in cancer cells; clinical chemistry.
3. A number of courses from the departments of chemistry, bacteriology, physiology, genetics, botany and zoology may be accepted as part of the graduate program in consultation with the head of the department of biochemistry.

4. *Graduate Courses*

501. Advanced Laboratory—Staff (0-6; 0-6)

511. Enzymology (3-0; 0-0)
N. B. Madsen and G. R. Schonbaum

521. Nucleic Acids (0-0; 3-0)
J. S. Colter, B. Lane, W. Paranchych and E. E. Townsend

531. Chemistry of Proteins (3-0; 0-0)
L. B. Smillie and C. M. Kay

541. Nucleotide Metabolism (0-0; 3-0)
A. R. P. Paterson, J. F. Henderson, A. Hampton

561. Chemistry of the Erythrocyte—H. B. Collier (0-0; 3-0)

571. Recent Advances—Staff (2-0; 2-0)

N.B. — Not all graduate courses are offered every year. The head of the Department should be consulted regarding the availability of graduate courses in any academic session.

BIOLOGY

Instruction offered by members of the Departments of Botany, Entomology, Genetics, Microbiology and Zoology.

584. Biological Ultrastructure (3-0; 0-0)
Structure of animal and plant tissues, bacteria and viruses as revealed by the electron microscope.
Pre- or corequisites: Zoology 481 or Botany 507 or Microbiology 402, or consent of departments.

585. Electron Microscopy (0-0; 3-3)
Theory and practice of electron microscopy; preparation procedures.
Prerequisite: Consent of departments.

BOTANY

1. The Department of Botany offers programs of course work and research leading to the degrees of Master of Science and Doctor of Philosophy in Botany.
2. Teaching and research assistantships are available for qualified students as well as financial assistance through research grants to staff members in some fields of botany. Financial assistance can usually be arranged for graduate students during the summer months.
3. The Department has well equipped research laboratories for investigations in the following fields:— *Anatomy*: developmental studies with roots, root hairs and leaves; *Biochemistry* and *Physiology*: the biochemistry of seed germination, pathways for amino acid biosynthesis, studies of transmethylation and transamination reactions, intermediary metabolism of higher plant tissues; *Ecology*: synecological studies of grassland, parkland, mountain, boreal and subarctic plant communities with emphasis on structure, classification and productivity; *Morphogenesis*: studies in growth correlations, organogenesis, tissue differentiation, phyllotaxis and plant movement; *Mycology*. sexuality and cytology of fungi, taxonomy of Gastero-

mycetes, mechanisms of spore dispersal, classification of Basidiomycetes; *Phycology;* ecology of fresh-water algae; *Taxonomy*—studies of Western Canadian and Arctic taxa using a variety of modern techniques including cytology and chromatography.

4. A number of senior and advanced courses offered by departments in the Faculties of Science are accepted as part of M.Sc. and Ph.D. programs in Botany. The head of the Department of Botany must be consulted in the selection of these.

5. *Graduate Courses*

503. Field Course in Botany—G. H. La Roi

504. Advanced Mycology—H. J. Brodie, L. L. Kennedy (6L; 6L)

506. Advanced Taxonomy—J. G. Packer (6L; 6L)

507. Advanced Plant Anatomy and Histology—R. G. H. Cormack (6L; 6L)

508. Vegetation Analysis—G. H. La Roi (0-0; 3-3)

509. Pollen and Spore Morphology—L. L. Kennedy (0-0; 3-3) or (3-3; 0-0)

510. Environment Analysis—G. H. La Roi (3-4; 0-0)

511. Advanced Plant Ecology—G. H. La Roi (0-0; 3-0)

531. Advanced Phycology—L. L. Kennedy (6L; 6L)

551. Advanced Plant Biochemistry (3-0; 0-0) or (0-0; 3-0)
Mary Spencer and E. A. Cossins
(This course is identical to Plant Physiology and Biochemistry 551.)

BUSINESS ADMINISTRATION AND COMMERCE

1. The Faculty of Business Administration and Commerce offers a program of study leading to the degree of Master of Business Administration. The M.B.A. program is for the qualified student who seeks preparation for a professional career in management.

2. No specific undergraduate major or series of courses is required for entrance. The program has been designed to accommodate those who have their undergraduate academic training in the liberal arts, engineering or the sciences, as well as commerce graduates.

3. Admission into the M.B.A. program requires the applicant to meet the requirements of the Faculty of Graduate Studies and be approved by the Faculty of Business Administration and Commerce. Approval by the Faculty of Business Administration and Commerce depends upon the undergraduate grades, test score on the Admissions Test for Graduate Study in Business, and practical experience of the applicant.

4. All applicants are required to write the Admission Test for Graduate Study in Business and have their scores forwarded to the Chairman, Division of Graduate Studies, Faculty of Business Administration and Commerce. Write to Admission Test for Graduate Study in Business, Educational Testing Service, Princeton, New Jersey for further information about this test.

5. It is strongly recommended that applicants have experience in business or government before entering the M.B.A. program.

6. The time required to complete the Master's program varies according to the undergraduate education of the student and the thesis project undertaken. A student with a four-year degree in commerce or business administration may complete the requirements in one year. Other students will normally need two years of course work and research to complete the requirements.
7. The first year of the program consists of accelerated undergraduate courses designed to provide the student with a foundation for graduate study in business administration. The first year of study covers the areas of accounting, finance, marketing, production, research methodology, statistics, and economic analysis. In the second year of study the student is required to take Business 551, 555, 556 and one of the advanced seminars.
8. For more information write to the Chairman, Division of Graduate Studies, Faculty of Business Administration and Commerce.
9. A limited number of fellowships and assistantships are available.
10. *Graduate Courses*

Business

551. Administrative Policy	(3-0; 3-0)
555. Business Policy	(3-0; 0-0)
556. Business Policy	(0-0; 3-0)

Advanced Seminars

560. Accounting	(3-0; 3-0)
561. Finance	(3-0; 3-0)
562. Production	(3-0; 3-0)
563. Marketing	(3-0; 3-0)
564. Industrial Relations	(3-0; 3-0)
565. Business Analysis	(3-0; 3-0)

CHEMICAL AND PETROLEUM ENGINEERING

1. The Department of Chemical and Petroleum Engineering offers facilities for advanced training and research leading to the M.Sc. and Ph.D. degree in Chemical Engineering and Petroleum Engineering.
2. For the Ph.D. program, all the requirements of the Faculty of Graduate Studies must be met. In addition, the Department requires that the candidates shall have satisfactorily completed approved courses in the major field and in at least one minor. Minimum requirements in the major field are courses equivalent to 21 term hours exclusive of seminar; minimum requirements in the minor field are courses equivalent to 12 term hours. As part of the requirements for demonstrating competence for admission to candidacy for the Ph.D., a student must pass the comprehensive examinations set by the Department. These consist of three written 3-hour examinations embracing the major fields of Chemical Engineering. They are normally taken by the student after one year of graduate studies during which the bulk of the course requirements have been met. Although the

timing would depend on circumstances, comprehensive examinations would normally be offered at the end of May.

3. For the Master of Science degree, graduate work comprising both course and research work equivalent to a minimum of 12 months of full-time study is required for a student possessing an undergraduate degree (in the same field) from a recognized university. The Department will also accept qualified applicants for the M.Sc. degree in Petroleum Engineering with degrees in Chemical and Mechanical Engineering and has planned the program so that these students may be able to complete their course requirements in one academic year. Graduates in other fields may be admitted under special arrangements which may involve the completion of certain key undergraduate courses. The Master programs are designed so that about one-half to two-thirds weight i.e. 18 to 24 term hours is given to course work and the balance to research and thesis, making a total of 36 term hours exclusive of seminar. Certain graduate courses are mandatory. Details of all programs must be worked out in consultation with the Department.
4. In chemical engineering, active research programs are being carried out in the following fields: rheology of non-Newtonian fluids, two-phase flow, hydrocarbon P-V-T- and gas hydrate studies, computer models of chemical reactors, applied mathematics in design, vapor phase reactions of the lower paraffin hydrocarbons, reaction kinetics and catalysis, fluid dynamics of gas-solid systems, process dynamics.

   In petroleum engineering, facilities are available for research in fluid flow through porous media, drilling fluids, electrical and physical characteristics of reservoir rocks, crude oil rheology and pipeline flow, miscible fluid displacement phenomena, flow phenomena in heterogeneous rock systems.
5. Teaching assistantships are available for qualified students on a part-time or full-time basis with remuneration according to the student's background and the hours of service. Scholarships and fellowships are available for research in both the fields of Chemical and Petroleum Engineering. Summer assistance can usually be arranged for students continuing their research through the summer months without scholarship support.

6. *Graduate Courses*

Chemical Engineering—

561. Advanced Heat Transfer	(3-0; 0-0)
562. Advanced Mass Transfer Gperations	(0-0; 3-0)
564. Applied Kinetics and Catalysis	(0-0; 3-0)
566. Process Control	(3-0; 0-0)
567. Advanced Thermodynamics	(0-0; 3-0)
568. Selected Topics in Fluid Mechanics	(3-0; 0-0)
572. Graduate Seminar	(1-0; 1-0)
574. Numerical Solutions of Engineering Problems	(0-0; 3-0)
577. Mathematical Applications	(3-0; 0-0)
578. Advanced Mathematical Applications	(0-0; 3-0)
595. Advanced Topics in Chemical Engineering	(3-0; 0-0)

Petroleum Engineering—

580. Advanced Physical Properties and Behavior of Petroleum Fluids	(0-0; 3-0)
583. Advanced Topics in Petroleum Production Mechanisms	(3-0; 0-0)
584. Secondary Recovery	(0-0; 3-0)
585. Fluid Mechanics of Natural Gas Production	(3-0; 0-0)
592. Graduate Seminar	(1-0; 1-0)
595. Advanced Topics in Petroleum Engineering	(0-0; 3-0)

CHEMISTRY

1. The Department of Chemistry has research laboratories and instructional facilities for at least one hundred and thirty graduate students proceeding to the M.Sc. and Ph.D. degrees in Chemistry.

2. The active research interests of the staff include:— *Analytical*: polarography; electronalytical techniques such as chronopotentionetry; *Electrochemistry*: electrode processes, solvation and transport phenomena; *Inorganic Chemistry*: organometallic compounds, hydrides and metal carbonyls, transsitional metal fluorides, halogen, and perfluoralkyl derivatives of phosphorus; reactivity of coordinated ligand, ligand exchange reactions; *Kinetics*: free radical and ionic reactions by mass spectroscopy, isotope studies in acid-base catalysis; the reactions of active nitrogen, studies on peptide reactions in aqueous solutions; *Organic*: degradation, structural and synthetic studies on natural products, chemistry of indoles, acetals of mercapto polyhydroxy compounds, reductive cleavage of acetals, condensation of substituted toluenes, synthesis via organometallic compounds, reduction of nitro compounds, organosilicon, germanium and tin chemistry, chemistry of "onium" compounds, conformational analysis, chemistry of large ring compounds, stable free radicals, reactions of acetylenes and allenes, mechanisms and synthesis in carbohydrate chemistry, synthesis and structure activity correlations of antibiotics, bioorganic chemistry, biosynthesis of natural products, nucleic acid sugars; study of condensation reactions of ketones, effect of solvent on dicarbonian nucleophilic character; synthesis of bridge ferrocenes, synthesis of strained systems and of π-electron systems, heterocyclic chemistry; alkali metal aromatic complexes, reactions of nitrogen ylides; *Physical Organic*: mechanisms and stereochemistry of solvolytic reactions, kinetics of reactions in solution, electron transfer processes between inorganic ions and organic substrates, reactions of azo and diazo compounds, mechanisms of free radical reactions in solution; *Photochemistry;* photochemical kinetics and free radical kinetics and free radical reactions, primary process studies in photochemistry, reactions of electronically excited atoms and molecules, photosensitized reactions, reaction of radicals with solids; *Radiation chemistry*: radiation chemistry of organic compounds, radiation initiated free radical chain reactions, radiation induced conductance of organic compounds; *Spectroscopy*: active nitrogen flame studies by N.M.R. and infrared, relation of infrared bond parameters to molecular structure, infrared spectroscopy of organic compounds. Application of ultraviolet and electron spin resonance spectroscopy to problems in molecular structure,

high resolution N.M.R., electronic absorption and emission spectroscopy; *Theoretical chemistry*: molecular orbitals, selfconsistent-field theory.

3. Candidates for the M.Sc. and Ph.D. degrees in Chemistry should be graduates in Chemistry or Chemical Engineering from approved Universities, who meet the entrance requirements of the Faculty of Graduate Studies. All arrangements must be made through consultation with Professor H. E. Gunning, Head of the Department.

4. *Graduate Courses*

511. Instrumentation in Chemical Analysis—W. F. Allen (3-6; 0-0)
513. Electronics for Scientists—J. A. Plambeck (3-3; 0-0)
530. Inorganic Chemistry—W. A. G. Graham (3-3; 3-3)
550. Organic Chemistry—D. Darwish (3-6; 3-6)
551. Qualitative Organic Analysis (2-6; 0-0)
553. Chemistry of Carbohydrates—R. U. Lemieux (3-0; 0-0)
555. Theoretical Organic Chemistry—R. J. Crawford (3-0; 0-0)
557. Free Radical Reactions in Organic Chemistry—D. D. Tanner (0-0; 3-0)
559. Natural Products (0-0; 3-0)
561. Advanced Organic Synthesis—K. R. Kopecky (3-0; 0-0)
572. Advanced Physical Chemistry—P. Kebarle and G. R. Freeman (3-6; 3-6)
573. Electrochemistry—R. N. O'Brien (0-0; 3-0)
583. Quantum Chemistry—S. Fraga (0-0; 3-0)
587. Special Topics in Free Radical Chemistry—H. E. Gunning (0-0; 3-0)
589. Statistical Mechanics—S. Fraga (3-0; 0-0)
591. Radiation Chemistry—G. R. Freeman (3-0; 0-0)
593. Molecular Spectroscopy—A. H. Kalantar (0-0; 3-0)
595 Photochemistry—H. E. Gunning (3-0; 0-0)
597. Macromolecular Chemistry (3-0; 0-0)
599. Chemical Applications of Mass Spectrometry—P. Kebarle (3-0; 0-0)
602. Departmental Research Seminar—H. E. Gunning (2s-0; 2s-0)
604. Advanced Research Seminar—Chemistry Staff (2s-0; 2s-0)
613. Electroanalytical Chemistry and Polarography—W. E. Harris (3-0; 0-0)
615. Advanced Analytical Chemistry—W. E. Harris (3-0; 0-0)
617. Analytical Spectroscopy—W. F. Allen (0-0; 3-0)
633. Advanced Inorganic Chemistry (0-0; 3-0)
637. Topics in Structural Inorganic Chemistry—R. G. Cavell (0-0;3-0)
655. Physical Methods of Organic Chemistry—S. Masamune (3-0; 0-0)
657. Physical Organic Chemistry—D. Darwish (0-0; 3-0)
659. Heterocyclic Chemistry—S. G. McGeachin (0-0; 3-0)
670. Advanced Physical Chemistry—H. E Gunning (3-0; 3-0)
675. Magnetic Resonance Spectroscopy—J. S. Martin (3-0; 0-0)
677. Physical Chemistry—P. Kebarle (3-0; 0-0)

679. Chemical Kinetics—G. R. Freeman (0-0; 3-0)

683. Quantum Chemistry (0-0; 3-0)

685. Solution Kinetics—H. B. Dunford (0-0; 3-0)

CIVIL ENGINEERING

1. The Department of Civil Engineering offers programs of course work and research leading to the degrees of Doctor of Philosophy and Master of Science.

   Active research programs in the Department include:

Soil Mechanics—strength of cohesive soils under high confining pressures; field piezometer studies; engineering and geological aspects of Upper Cretaceous deposits; application of physical-chemical concepts; triaxial shear strength; consolidation and swelling characteristics.

Highway Engineering—soil stabilization with bitumen, lime; cracking of asphaltic concrete pavements; repeated loading of pavements; cyclic triaxial loading of stabilized soil mixtures; studies in geometric design.

Structure and Strength of Materials

Concrete—combined torsion and bending: bond and splitting stresses; shear strength; long columns, bending stresses in hyperbolic paraboloid shells; anchorage bond in prestressed beams.

Steel—deformations in the plastic range; frame stability, ultimate strength of composite sections.

Timber—studies of glulam beams and connectors.

Concrete Technology—freeze thaw durability of concrete; air-entrained concrete; creep and shrinkage.

Hydraulics and Hydrology—analysis of river regime; velocity distribution in transient pipe flow; ice problems; aquifer studies; measurement of rapidly varying pressures; bed and surface level plotting; transport of fluidized solids.

Sanitary Engineering—death rate of pathogenic bacteria in sewage lagoons; settling basin design.

2. Doctor of Philosophy programs are offered in the fields of Soil Mechanics and Foundations, Hydraulics and Hydrology, and Structures and Strength of Materials. The amount of course work in a Ph.D. program varies depending on the candidate's background.
3. Master of Science programs normally consist of eight one-term courses or equivalent, four of which must be in the candidate's major field of interest, plus a thesis. Other weightings between course work and thesis may be arranged.

   A candidate may complete a Master's program in twelve months. However, a student is advised to spend two winter sessions, during which he can devote more time to his thesis topic.
4. Financial assistance is available in the form of graduate teaching assistantships and research assistantships.

5. *Graduate Courses* (Offered only if a sufficient number of students enroll)

510. Pavement Design	(3-0; 0-0)
511. Highway Materials	(0-0; 2-2)
512. Transportation Engineering I	(3-0; 0-0)
513. Transportation Engineering II	(0-0; 3-0)
520. Sanitary Engineering	(3-0; 3-0)
522. Water and Waste Treatment	(0-0; 2-4)
530. Advanced Fluid Mechanics	(3-0; 3-0)
531. Engineering Aspects of Ground Water Hydrology	(3-0; 0-0)
532. Surface Water Hydrology	(0-0; 3-0)
533. River Engineering I	(0-0; 3-0) or (3-0; 0-0)
534. River Engineering II	(3-0; 0-0) or (0-0; 3-0)
535. Open Channel Flow I	(3-0; 0-0)
536 Open Channel Flow II	(0-0; 3-0)
539. Hydraulics of Earth Dams and Related Structures	(2-2; 0-0)
540. Soil Mechanics and Foundations	(3-0; 3-0)
541. Soil Properties	(2-3; 2-3)
542. Advanced Soil Mechanics Problems	(0-0; 3-0)
543. Soil Mechanics and Foundations	(3-0; 0-0)
544. Earth and Rock-Fill Dams	(0-0; 3-0)
555. Cement and Concrete Technology	(3-0; 0-0) or (0-0; 3-0)
561. Plastic Analysis and Design of Structures	(0-0; 3-0)
562. Behaviour and Design of Steel Structures	(3-0; 0-0)
563. Behaviour and Design of Reinforced Concrete Members	(3-0; 0-0)
564. Behaviour and Design of Reinforced Concrete Structures	(0-0; 3-0)
565. Behaviour and Design of Prestressed Concrete Structures	(0-0; 3-0)
571. Intermediate Structural Analysis	(3-0; 0-0)
572 Advanced Structural Analysis	(0-0; 3-0)
573. Analysis and Design of Roof Shells	(0-0; 3-0)

CLASSICS

1. The Department and the University are, through the kindness of the Andrew Agrios Memorial Fund, associated institutions of the American School of Classical Studies at Athens. The Department is also the holder of a collection of antiquities a part of which is on permanent loan from the Royal Ontario Museum of Archaeology and the Norton collection. It also possesses a collection of Roman Imperial coins for numismatic study.
2. A limited amount of financial assistance for graduate students is available. Applications should be received by the Head by March 1.
3. The Department offers graduate work leading to the Master's degree in three main fields: in Classics, including languages, literatures, Ancient History and Archaeology; in Latin; and in Greek.

Programs in Latin or Greek and a modern language may be arranged through the Committee of Comparative Literature or the Department of General Linguistics.

4. The total work of a student with an honors B.A. in Classics (or its equivalent) will normally consist of three courses at the 500 or 600 level in the department, a thesis appropriate to the major field, an oral defense of the thesis, and a level of competence in Greek or Latin prose composition to the satisfaction of the department. The student will spend a minimum of one year in residence.
5. The total work for a student from a general undergraduate program will consist of at least seven courses, five of which must be at the 500 or 600 level, a thesis, an oral defense and a level of competence in Greek or Latin prose composition to the satisfaction of the department. There must be a total in B.A. and M.A. work of at least eleven courses in Latin and Greek, with a minimum of three courses in the secondary language.
6. Demonstrated proficiency (to the satisfaction of the department) in French, German or Italian is required before any Master's degree will be awarded.

5. *Graduate Courses*

Greek 501.	**Plato and Aristotle**	(3-0; 3-0)
Greek 502.	**Homer, Iliad**	(3-0; 3-0)
Greek 503.	**Greek Lyric Poetry**	(3-0; 3-0)
Greek 505.	**Greek Comedy**	(3-0; 3-0)
Greek 506.	**Greek Orators**	(3-0; 3-0)
Greek 507.	**Greek Tragedy**	(3-0; 3-0)
Greek 508.	**Thucydides**	(3-0; 3-0)
Greek 509.	**Hellenistic Poetry**	(3-0; 3-0)
Greek 511.	**Advanced Greek Prose Composition**	(1-0; 1-0)
Greek 517.	**Studies in Greek Literature**	(3-0; 3-0)
Greek 518.	**Readings in Hellenistic History**	(3-0; 3-0)
Greek 519.	**Readings in Greek History**	(3-0; 3-0)
Greek 521.	**History of the Greek Language** Prerequisite: Greek 300 or equivalent.	(3-0; 0-0) or (0-0; 3-0)
Greek 522.	**Greek Epigraphy** Prerequisite: Greek 300 or equivalent.	(3-0; 0-0) or (0-0; 3-0)
Greek 620.	**The Greek and Latin Epigrams**	(3-0; 3-0)
Latin 501.	**Cicero**	(3-0; 3-0)
Latin 502.	**Roman Comedy**	(3-0; 3-0)
Latin 503.	**Epic and Didactic Poetry**	(3-0; 3-0)
Latin 505.	**Vergil, Complete Works**	(3-0; 3-0)
Latin 506.	**Sanskrit**	(3-0; 3-0)
Latin 507.	**Petronius, Apuleius**	(3-0; 3-0)
Latin 508.	**Tacitus**	(3-0; 3-0)
Latin 509.	**Roman Elegiac Poets**	(3-0; 3-0)

Latin 510. Roman Satire (3-0; 3-0)

Latin 511. Advanced Latin Prose Composition (1-0; 1-0)

Latin 513. Latin Lyric Poetry (3-0; 3-0)

Latin 517. Studies in Latin Literature (3-0; 3-0)

Latin 531. History of the Latin Language (3-0; 0-0)or(0-0; 3-0)
Prerequisite: a senior Latin course.

Latin 532. Latin Epigraphy (3-0; 0-0)or(0-0; 3-0)
Prerequisite: a senior Latin course.

Latin 533. Latin Paleography (3-0; 0-0)or(0-0; 3-0)
Prerequisite: a senior Latin course.

Latin 534. Medieval Latin (3-0; 0-0)or(0-0; 3-0)
Prerequisite: a senior Latin course.

COMPARATIVE LITERATURE STUDIES

Applicants for graduate work in Comparative Literature should, in their previous programs, have concentrated in the literature of one particular language. They must have a competent reading knowledge of at least one language other than English in order to undertake an M.A. program and of at least two languages other than English in order to undertake a Ph.D. program. Programs leading to the Ph.D. degree in Comparative Literature may be undertaken only in prescribed literatures. Graduate programs will be arranged and administered by an Interdepartmental Committee comprised of members from the Departments of Classics, English, Germanic Languages and Literature, Romance Languages and Literature, and Slavonic Languages and Literature.

The following courses may be taken for graduate credit in addition to relevant graduate courses in literature offered by individual departments:

505. The Theory of the Study of Literature (3-0; 3-0)

520. Comparative Studies in Medieval Literature (3-0; 3-0)

530. Comparative Studies in European Drama of the Sixteenth and Seventeenth Centuries (3-0; 3-0)

550. Comparative Studies in Romantic Literature (3-0; 3-0)

555. Comparative Studies in Literature of the late Nineteenth Century (3-0; 3-0)

620. Comparative Slavonic Literature (3-0; 3-0)

649. Franco-German Literary Relations during the Nineteenth Century (3-0; 3-0)

695. Anglo-German Literary Relations from the Sixteenth to the Nineteenth Century

COMPUTING SCIENCE

1. The Department offers a program of course work and research leading to the Master of Science degree. The aim of the program is to acquaint students with topics of current interest in Computing Science and related fields and to train them in the efficient use of numerical techniques. A thesis is required on an approved topic.

2. The work of the degree will normally require one year following graduation from a program equivalent to the honors mathematics or physics programs at the University of Alberta. The Department will also consider good students with different backgrounds, for example, graduates in engineering physics and engineering although in these cases the program will likely take more than one year.

3. The required graduate courses are Computing Science 640 and 641 and one other approved by the Department.

4. *Graduate Courses*

540. Mathematical Programming

640. Advanced Numerical Analysis (3-3; 3-3)

641. Advanced Automatic Digital Computers and Programming (3-6; 3-6)

DAIRY AND FOOD SCIENCE

1. Graduate study may be undertaken in Dairy Science or Food Science. A well equipped small scale dairy and food processing laboratory, as well as chemical and microbiological laboratories are available for research purposes.

2. The research of this department receives financial support from such bodies as the Canada Department of Agriculture, The National Research Council of Canada, The Medical Research Council, the Province of Alberta and others. Such grants-in-aid provide for a number of assistantships. The assistants, if eligible, are permitted to register in the Faculty of Graduate Studies and their research findings may be presented to the University as M.Sc. or Ph.D. theses. Various Graduate Fellowships and Scholarships such as those offered by the above-mentioned organizations are tenable in the department as also are Graduate Teaching Assistantships, Graduate Research Assistantships and Graduate Service Assistantships awarded by the University.

3. A reading knowledge of French, German or Russian within the field of interest is required for candidacy for the Ph.D. degree, but credit in approved University courses is an acceptable substitute.

   Graduates who desire to take a graduate degree should consult a member of the department who may be able to suggest a program of study suited to the interests of the student.

4. Graduate Credit may be given for certain extra-departmental undergraduate courses including Animal Science 468, 469; Microbiology 401, 402, 403; Soil Science 430; Biometrics 455; Horticulture 455; Plant Pathology 540.

   Graduate credit may also be given for the following courses which are offered in the department only to fourth year students providing these courses are not in the student's field of study.

Dairy and Food Processing 451—F. W. Wood (3-3; 0-0)

Dairy and Food Processing 452—F. W. Wood (0-0; 3-3)

Dairy and Food Microbiology 465—L. F. L. Clegg (3-0; 0-0)

Dairy and Food Microbiology 466—H. Jackson (0-0; 3-3)

Dairy and Food Microbiology 560—H. Jackson (1L-4; 0-0)

Dairy and Food Microbiology 561—L. F. L. Clegg and H. Jackson (0-0; 1L-4)

Dairy and Food Microbiology 562—H. Jackson (3-0; 0-0)

Dairy and Food Microbiology 563—H. Jackson (0-0; 3-0)

Dairy and Food Chemistry 474—J. M. deMan (3-3; 0-0)

Dairy and Food Chemistry 475—J. M. deMan (0-0; 3-3)

Dairy and Food Chemistry 476—J. M. deMan (3-3; 0-0)

5. *Graduate Courses*

Dairy and Food Science 650. Seminar—All Staff (1S-0; 1S-0)

Dairy and Food Microbiology 660 (0-0; 3-0)or(3-0; 0-0)
H. Jackson and L. F. L. Clegg

Dairy and Food Chemistry 671—J. M. deMan (0-0; 3-3)

Dairy and Food Chemistry 672—J. M. deMan (0-0; 1-3)

DENTISTRY

1. The Faculty of Dentistry has research laboratories and instructional facilities for a limited number of graduate students proceeding to the M.Sc. degree.
2. Dental graduates may undertake graduate programs in either basic science or clinical science. Students without dental qualifications, but who hold a B.Sc. degree in biological or physical science are eligible for graduate work in the division of basic research in dentistry.
3. Fellowships and assistantships are available. Applications may be submitted at any time throughout the year.
4. The active research interests of the staff include:—

   Anatomy—growth and development; calcification and decalcification; mammalian cell and organ culture.

   Biochemistry—absorption and metabolism of calcium and phosphorus; glycoproteins and iron metabolism of tumor-bearing animals; enzymes of the gastriointestinal tract.

   Microbiology—animal cell culture; virology; bacteriology; immunology.

   Dental Public Health and Epidemiology—growth patterns of young children; fluoride intake; topical fluoride; administration of public health programs.

   Clinical Dentistry—pediatric dentistry including interceptive orthodontics and treatment for handicapped children.

5. *Graduate Courses*

Dentistry 500. Cephalometrics (1-3; 1-3)
Prerequisite: Permission of the department.

Dentistry 501. Advanced Pedodontics (1-6; 1-6)
Prerequisite: Permission of the department.

Dentistry 502. Advanced Oral Pathology (0-0; 1-2)
K. A. McMurchy and Staff
A lecture and laboratory course dealing with techniques for obtaining and preserving specimens for pathological examination, the interpret-

ation of pathological reports, and the pathology of some of the rarer oral lesions.

Dentistry 503. Mineralization in Biological Systems (3-0; 0-0)
Members of the basic science division, Faculty of Dentistry
A lecture course dealing with the developmental morphology and the chemical nature of the protein and mineral phases of calcified tissues in man and animals. Particular emphasis will be given to calcification and decalcification of teeth and bones.

ECONOMICS

1. The department offers programs in Economics leading to the M.A. and Ph.D. degrees.
2. Inquiries regarding details of programs offered within the department should be directed to the Head of the Department. Applications for admission to graduate study must be submitted on forms supplied by the office of the Dean of Graduate Studies.
3. Students entering the graduate program are required to have or to make up credit in a basic course in Calculus and one in Statistics in addition to their normal graduate program.
4. All applications for admission received by March 31st are considered for departmental teaching and research assistantships.
5. Details of scholarships and other financial assistance available are included in the Calendar.
6. *Graduate Courses*

Economics—

500. Price and Distribution Theory (3s-0; 3s-0)

501. Economic Analysis (3s-0; 3s-0)

504. Econometrics (3s-0; 3s-0)

506. Mathematical Economics (3s-0; 3s; 0)

510. Economics of Underdeveloped Countries (3s-0; 3s-0)

511. Economic Development of Canada (3s-0; 3s-0)

520. International Economics (3-0; 3-0)
An intensive study of the theory of international trade and the balance-of-payments.

530. Labor Economics (3-0; 3-0)
Analysis of the factors influencing the supply and demand for labor services and the process of wage determination; the impact of collective bargaining, legislation and government policy on wage levels, aggregate employment and the structure of employment.

550. The Public Sector of the Economy (3s-0; 0-0)

551. Intergovernmental Fiscal Relations (0-0; 3s-0)

560. Agriculture in Developing Countries (3s-0; 3s-0)

572. Industrial Organization (3-0; 3-0)
An advanced study of contemporary industrial structure, behavior and performance; an investigation of economic concentration and related Canadian and foreign public policies together with relevant theoretical considerations.

580. National Income and Economic Growth (3s-0; 3s-0)

590. Comparative Economic Systems (3-0; 3-0)
An intensive comparative study of important contemporary systems of economic organization.

593. Seminar in Slavonic and Soviet Studies (3s-0; 3s-0)
An Interdepartmental Seminar

600. Advanced Micro-Economic Analysis (3s-0; 3s-0)

604. Advanced Econometrics and Mathematical Economics (3s-0; 3s-0)

611. Economic Development (3s-0; 3s-0)

621. International Economics (3s-0; 3s-0)

631. Labor Problems (3s-0; 3s-0)

641. Monetary Theory and Policy (3s-0; 3s-0)

651. Public Finance and Fiscal Theory (3s-0; 3s-0)

653. Transportation and Public Utiliities (3s-0; 3s-0)

661. Agricultural Economics (3s-0; 3s-0)

671. Business and Government (3s-0; 3s-0)

680. Advanced Macro-Economics Analysis (3s-0; 3s-0)

691. Comparative Economics Systems (3s-0; 3s-0)

692. The Soviet Economy (3s-0; 3s-0)

EDUCATIONAL ADMINISTRATION

1. The Department of Educational Administration offers graduate instruction in a variety of programs in school administration. More particularly these programs are designed to assist students to prepare to serve as principals, superintendents of schools, and central administration officers, officers of provincial departments of education, and as professors of educational administration.
2. The Department makes special arrangements with public school systems and provincial departments of education so that facilities are available for student observation, research, participation in field projects and internships.
3. The work of the Department is closely coordinated with that of other departments in the Faculty of Education. Furthermore, approved courses complementing or supplementing a candidate's program in education may be taken from other departments in the University.
4. The research facilities provided through the Alberta Advisory Committee on Educational Research, sponsored jointly by the Faculty of Education, the Department of Education, the Alberta School Trustees' Association, The Alberta Teachers' Association, and the Alberta Federation of Home and School Associations, are available to graduate students in this Department. The Alberta Journal of Educational Research published under supervision of the Faculty is the official outlet for reports of research sponsored by the Alberta Committee on Educational Research.

5. Students who satisfy the admission requirements of the Faculty of Graduate Studies and who have the approval of the Department may pursue programs of study and research leading to the degrees of M.Ed., Ed.D., and Ph.D. in Educational Administration. Prospective students should first consult the Head of the Department for further information on the program and admission requirements.

6. A number of fellowships and assistantships in teaching and research are available for well-qualified candidates.

7. *Graduate Courses*

Ed. Adm. 500. Research Seninar
Non-credit. Hours to be arranged.

Ed. Adm. 525. Administration of Educational Personnel (3-0; 0-0)and/or(0-0; 3-0)

Ed. Adm. 559. Administration of Public Education in Canada (3-0; 0-0)and/or(0-0; 3-0)

Ed. Adm. 561. Evolving Concepts in Educational Administration (3-0; 0-0)and/or(0-0; 3-0)

Ed. Adm. 563. Administration of the Educational Program (3-0; 0-0)and/or(0-0; 3-0)

Ed. Adm. 565. Educational Finance (3-0;-0-0)and/or(0-0; 3-0)

Note: Full-year courses corresponding to the above five half-year courses (525, 559, 561, 563, and 565) are designated Ed. Adm. 526, 560, 562, 564, and 566 respectively.

Ed. Adm. 626. Administrative Behavior

Ed. Adm. 660. The Social and Political Environment

Ed. Adm. 662. Organization Theory

Ed. Adm. 664. The Problems of Educational Administration

Ed. Adm. 666. Education Finance

Note: Courses numbered in the 600's are conference courses in which credit is given according to work done, to a maximum of six hours.

EDUCATIONAL FOUNDATIONS

1. In this Department graduate programs leading to the M.Ed., Ph.D. and Ed.D. degrees are available in philosophy of education, history of education, sociology of education, and comparative education.

2. Graduate programs normally include related courses offered by liberal arts departments and may include courses from other departments of the Faculty of Education.

3. Inquiries concerning admission, programs, and teaching assistantships should be directed to the Head of the Department of Educational Foundations.

4. The research facilities provided through the Alberta Advisory Committee on Educational Research are available to graduate students in this Department. *The Alberta Journal of Educational Research* is the official outlet for reports of research sponsored by the Alberta Advisory Committee.

5. *Graduate Courses*

500. Education Seminar—Staff (3-0; 3-0)

514. Sociology of Education—B. Y. Card (3-0; 3-0)

532. Philosophical Foundations of Educational Research (3-0; 3-0)
G. R. Eastwood

571. Studies of Educational Change in Western Nations—R. E Eick (3-0; 0-0)

573. Functions of Education in the Development of Emerging Nations—R. E. Eick (0-0; 3-0)

581. History of Education in Western Europe Before 1900—K. H. Thomson (3-0; 0-0)

583. History of Education in the United States Before 1900—K. H. Thomson (0-0; 3-0)

585. History of Education in Eastern Canada—M. R. Lupul (3-0; 0-0)

587. History of Education in Western Canada—M. R. Lupul (0-0; 3-0)

592. Philosophy of Education—N. C. Bhattacharyya (3-0; 3-0)

602. Selected Topics—Staff

EDUCATIONAL PSYCHOLOGY

1. The Department of Educational Psychology provides instruction and guidance for suitable candidates proceeding to the degrees of M.Ed., Ph.D., and Ed.D. in the areas of: (a) Educational Psychology; (b) Child Psychology; (c) Adolescent Psychology; (d) Mental Hygiene; (e) Guidance; (f) Testing and Measurement; (g) Exceptional Children; (h) School Psychology.
2. The Department operates an Education Clinic which provides testing, diagnosis of special difficulties, and guidance for pupils referred to it from elementary and secondary schools.
3. Staff members and graduate students have access to a modest IBM installation housed in the Education Building, and to the facilities of the University's Computing Centre.
4. One assistantship in the Education Clinic is usually available in winter sessions and in those Summer Sessions when the Clinic is in operation. In addition, a number of research and teaching assistantships normally are available in winter sessions.
5. Before a student is admitted to candidacy for a graduate degree in the Department of Educational Psychology, his record must be acceptable to the Faculty of Graduate Studies and to the Department. The student should first consult with the Head of the Department who, together with members of the Department staff, will plan an appropriate program.
6. The Department of Educational Psychology maintains a close liaison with the Alberta Advisory Committee on Educational Research. The AACER, which was originally established with the aid of a grant from the Carnegie Corporation of New York, is now sponsored jointly by the Faculty of Education, the Alberta Department of Education, the Alberta School Trustees' Association, the Alberta Teachers' Association, and the Alberta Federation of Home and School Associations. *The Alberta Journal of Educational Re-*

search, published under the supervision of the Faculty of Education, is the official outlet for reports of research sponsored by the Alberta Advisory Committee on Educational Research.

7. *Graduate Courses*

500. Education Seminar
502. Introduction to Educational Research
508. Problems in Educational and Vocational Guidance
510. Theories of Counselling
512. Seminar and Practicum in Counselling
514. School Psychology
548. Psychology and Education of Exceptional Children
550. Teaching Speech to the Deaf
552. Psychology and Education of Mentally Handicapped
554. Psychology and Education of Gifted Children
556. Psychology and Education of Physically Handicapped
558. Psychology and Education of Emotionally Disturbed
570. Child Psychology
572. Psychology of Adolescence
574. Education Clinic
576. Statistics and Research Design in Education
578. Theory and Application of Measurement in Education
592. Social Psychology of School and Classroom
610. Advanced Theory and Practice of Counselling
670. Developmental Psychology
674. Problems of Adjustment of School Children
676. The Psychology of Learning
678. Educational Measurement and Experimental Research

ELECTRICAL ENGINEERING

1. The Department of Electrical Engineering offers postgraduate courses, leading to the M.Sc. and Ph.D. degrees, to qualified graduates of recognized Universities.
2. Considerable research facilities are available in a number of areas, notably control systems, microwaves, high vacuum technology, high voltage, power system analysis, medical electronics, particle accelerators, space research and plasmas.
3. A normal requirement for the M.Sc. degree is 4 graduate courses, at least one of which should be taken outside of the Department, and a short thesis.
4. For the Ph.D. programme, all requirements of the Faculty of Graduate Studies must be met. Course requirements depend upon individual circumstances and must be approved by the Department of Electrical Engineering. The main emphasis is on research leading to a thesis of high calibre.
5. Financial assistance can be arranged. This may take the form of part-time

teaching assistantships, scholarships listed under Awards and Financial Assistance, and through research grants.

6. Graduate courses normally offered are:

521. Modern Power System Problems	(2-3; 2-3)
530. Solid State Circuit Design	(2-3; 2-3)
541. High Vacuum Technology	(3-3/2; 0-0)
550. Network Analysis and Synthesis	(3-0; 3-0)
562. Sampled-Data Control Systems	(2-3; 2-3)
563. Non-Linear Control Systems	(2-3; 2-3)
564. Optimum Control Systems	(2-3; 2-3)
579. Logical Design of Digital Computers	(3-0; 0-0)
580. Microwave Measurements and Techniques	(2-0; 2-0)
591. Electromagnetic Engineering	(3-0; 3-0)
592. Waves in Plasma	(3-0; 3-0)
593. Elements of Plasma Theory	(2-0; 2-0)

ELEMENTARY EDUCATION

1. The Department of Elementary Education offers graduate instruction in a variety of programs related to kindergarten, primary and elementary education. These programs are designed to help prepare special consultants and supervisors, master teachers and personnel for teacher education institutions. The Department offers a Ph.D. program in Reading only.

2. The Department makes special arrangements with local school systems and the Alberta Department of Education so that facilities are available for student observation, research, and participation in field projects. Graduate students may also be associated with the Reading and Language Clinic operated by the Department which makes provision for the diagnosis and treatment of reading and language disabilities among children and young adults referred to the Clinic by neighboring school systems.

3. The work of the Department is closely coordinated with that of other departments in the Faculty of Education. Furthermore, approved courses complementing or supplementing a candidate's program in education may be taken from other departments in the University.

4. The research facilities provided through the Alberta Advisory Committee on Educational Research, sponsored jointly by the Faculty of Education, the Department of Education, the Alberta School Trustees' Association, the Alberta Teachers' Association, and the Alberta Federation of Home and School Associations are available to graduate students in the Department. *The Alberta Journal of Educational Research* published under the supervision of the Faculty is the official outlet for reports of research sponsored by the Alberta Advisory Committee on Educational Research.

5. Before a student can be admitted as a candidate for the M.Ed. or higher degree his record must be acceptable to the Faculty of Graduate Studies and to the Department. He should first consult the Head of the Department

who, together with the members of his staff, will plan an appropriate program.

6. Full-time attendance for a minimum period of one academic year at the university is required for the M.Ed. degree in elementary education.

7. A number of assistanships in teaching, research, and the supervision of student teaching are available for well-qualified candidates.

8. Undergraduate courses which may be taken for graduate credit:

Ed. CI 406. Social Studies in Elementary Education (3-0; 3-0)
Ed. CI 410. Art in the Elementary School (3-0; 3-0)
Ed. CI 414. Music in the Elementary School (3-0; 3-0)
Ed. CI 420. Reading at the Primary Level (3-0; 3-0)
Ed. CI 422. Reading at the Upper Elementary and Secondary Levels (3-0; 3-0)
Ed. CI 426. Curriculum and Instruction in the Kindergarten (3-0; 3-0)
Ed. CI 428. Mathematics in the Elementary School (3-0; 3-0)
Ed. CI 432. Science in Elementary Education (3-0; 3-0)
Ed. CI 436. French in the Elementary School (3-0; 3-0)
Ed. CI 438. Language in Elementary Education (3-0; 3-0)
Ed. CI 424. Diagnostic and Remedial Program (0-3; 0-3)
Ed. CI 446. Selection and Organization of Library Materials (3-1; 3-1)

9. *Graduate Courses*

Ed. CI 500. Elementary Education Seminar
Ed. CI 518. Physiology and Psychology of Reading
Ed. CI 520. Clinical Study of Remedial Reading
Ed. CI 522. Organization and Supervision of the Reading Program
Ed. CI 528. Program Development in Elementary School Mathematics
Ed. CI 538. Program Development in Elementary School Language
Ed. CI 602. Conference Course in Elementary Education
Ed. CI 618. Research in Reading

ENGLISH

1. The Department of English offers graduate work leading to the M.A. and Ph.D. degrees in English Language and Literature.

2. The department has regular provision for teaching assistantships. Application should be made, if possible, by April 1.

3. Program leading to the M.A.:
The total work of a student with an honors B.A. in English (or its equivalent) will normally consist of three graduate courses in the department, a thesis, and an oral defence of the thesis. The student will spend a minimum of one year in residence. The total work of a student from the general undergraduate program will normally consist of seven courses (4 undergraduate, 3 graduate), a thesis, and an oral defence of the thesis. A reading

knowledge of one foreign language will be required of all students (normally French or German, though other languages may be approved).

4. Program leading to the Ph.D.:
A student with an M.A. in English (or its equivalent) may be admitted as a provisional candidate for the Ph.D. degree. During the first year the student will be required to pass a qualifying examination, designed to test his fitness for advanced study. The total work of a provisional candidate will normally consist of four graduate courses (one of which will be taken outside the Department of English), and general examinations on English Language and Literature, written and oral. The student must demonstrate a reading knowledge of two foreign languages (usually French and German). After a student has passed all examinations, he will become a candidate for the Ph.D., and will then submit a thesis and make an oral defence of the thesis. The student will normally spend two years in residence.

5. Courses of study will be prescribed from the published list of Senior Undergraduate courses, and from the following graduate courses.

552. Conference Course	(3-0; 3-0)
560. Bibliography and Methods of Research	(1-0; 1-0)
568. Literary Criticism (Principles and History)	(3-0; 3-0)
576. Studies in the English Language	(2-0; 2-0)
584. Creative Writing	(3-0; 3-0)
588. Studies in American Literature	(3-0; 3-0)
590. Canadian and Commonwealth Literature	(3-0; 3-0)
592. Old Norse Literature	(3-0; 3-0)
610. Studies in Old English Literature	(3-0; 3-0)
614. Studies in Middle English Literature	(3-0; 3-0)
616. Chaucer	(3-0; 3-0)
622. The Scottish Chaucerians and English Literature of the Fifteenth Century	(3-0; 3-0)
628. Mediaeval Drama	(3-0; 3-0)
634. Studies in Renaissance Poetry	(3-0; 3-0)
640. Shakespeare	(3-0; 3-0)
641. Studies in Elizabethan and Jacobean Drama	(3-0; 3-0)
646. Seventeenth Century Poetry and Prose	(3-0; 3-0)
652. Milton	(3-0; 3-0)
654. Restoration and Eighteenth Century Drama	(3-0; 3-0)
658. Studies in Eighteenth Century Literature	(3-0; 3-0)
660. Studies in the Eighteenth Century Novel	(3-0; 3-0)
662. Studies in the Romantic Novel	(3-0; 3-0)
664. Studies in the Romantics	(3-0; 3-0)
670. Currents of Thought in English Literature since 1790	(3-0; 3-0)
671. Studies in Victorian Poetry	(3-0; 3-0)
672. The Victorian Novel	(3-0; 3-0)

676. Studies in the Modern Novel (3-0; 3-0)

678. Studies in Twentieth Century Prose (3-0; 3-0)

682. Studies in Twentieth Century Poetry (3-0; 3-0)

684. Studies in Modern Drama (3-0; 3-0)

692. Techniques of the Novel (3-0; 3-0)

ENTOMOLOGY

1. Laboratory space is available for about twenty graduate students. For research in taxonomy an extensive collection and reprint library exists. There is basic equipment for study and experiment in morphology, physiology, ecology, and applied entomology. Funds for special projects can usually be made available.
2. Candidates may register for the M.Sc. or Ph.D. degree.
3. Programs may include Entomology 314, 471, 476, 522, 556, 560, 610, 621, and 650 and courses from other departments appropriate to the students' needs and interests such as the following: Bacteriology 400, Biochemistry 350, Botany 301, 302, 310, 320, 504, 505, Chemistry 372, 312, Geology 353; German 310, Genetics 462, Philosophy 360, Physics 341, Physiology 361, 462, 505, 506, Plant Pathology 481, Biometrics 454, 603, Mathematics 255, 540, Soil Science 430, Zoology 300, 320, 350, 460, 580, 521.
4. Undergraduate courses which may be taken for graduate credit.

471. A Project in Applied Entomology—Staff

476. Insect Toxicology—W. G. Evans (2-4; 2-4)

5. *Graduate Courses*

522. Insect Taxonomy—G. E. Ball (2-6; 2-6)

556. Insect Physiology—B. Hocking (2-4; 2-4)

560. Insect Ecology—W. G. Evans (2-4; 2-4)

***610. Advanced Morphology, Histology**—Janet Sharplin

621. Advanced Taxonomy—G. E. Ball (0-6; 0-6)

***650. A Project in Insect Physiology**—B. Hocking

GENETICS

1. The Department offers programs leading to the M.Sc. and Ph.D. degrees.
2. The department has excellent laboratory facilities for research in a number of fields, including cytology and cytogenetics, microbial genetics, radiation genetics, biochemical genetics. Extensive facilities are also available for plant genetics; these include greenhouse, growth chamber and field-plot accommodation. Additional facilities such as an electron microscope, computer and Van de Graaf accelerator are available on an interdepartmental basis.
3. Investigations being carried out in the department include studies with monosomics of *Triticum,* cytogenetics of *Medicago,* genetics of *Hordeum,* radiation and chemical mutagenesis, biochemical genetics, biometrical gen-

*No set hours: Credit according to work done, up to a maximum of *one* full course.

etics, physiology of cell division, and the genetics and biochemistry of parasitism.

4. Eligible applicants will be admitted for graduate work only if facilities and space are available for the project they propose to undertake. Graduate students are not required to take a foreign language for the Master's degree but are advised to do so if they plan to continue beyond it.
5. Normally all senior courses are acceptable in the graduate program. It should be emphasized that course outlines are normally based on the student's previous training and anticipated needs in the field he has chosen.
6. *Graduate Courses*

505. Reading and Research projects in Genetics and Plant Breeding—Genetics Staff (1s-0; 1s-0)
511. Cytology—G. W. R. Walker (3-3; 0-0)
515. Cytogenetics—J. Kuspira (0-0; 3-3)
517. Genetical Statistics—G. W. R. Walker (3-3; 0-0)
520. Quantitative Genetics—L. P. V. Johnson (0-0; 3-0)
545. Biochemical Genetics—D. Nash (0-0; 3-0)
552. Radiation Genetics—J. Weijer (0-0; 3-3)
586. Developmental Genetics—R. Ruth (0-0; 3-0)
590. Classic Contributions to Genetics—L. P. V. Johnson (3-0; 0-0)
601. Genetics Seminar (1s-0; 1s-0)
635. Advanced Microbial Genetics—J. Weijer (0-4; 0-4)
650. Genetics of Parasitic Systems—Clayton Person (3-0; 0-0)

GEOGRAPHY

1. The Department of Geography offers the M.A., M.Sc., and Ph.D. in Geography. Graduate work for each of these degrees includes presentation of an acceptable thesis.
2. The Department will approve only thesis topics which lie within the research specialty of one or more of its staff members.
3. M.A. and M.Sc. candidates' programs will be prepared under the regulations for "The Master's Degree", with the further requirement of a reading knowledge of a modern foreign language other than English (ordinarily French or German).
4. Ph.D. candidates programs will be prepared under the regulations for "The Degree of Doctor of Philosophy", with the further requirement of a reading knowledge of two modern foreign languages other than English, one of which must be French or German.
5. A number of assistantships (teaching, research, service) are available for qualified students. Other awards are set out elsewhere in this calendar and in detail in the Awards Calendar.
6. Courses in other departments may be chosen as subjects of minor interest with the approval of the Department.
7. Courses of study will be prescribed from the published list of senior under-

graduate courses (see Arts and Science Calendar) and from the following graduate courses:

500. History and Nature of Geography—O. F. G. Sitwell (1-2s; 1-2s)
501. Air Photo Interpretation—A. H. Laycock (6L; 6L)
502. Reading and Seminar Course—Staff
504. Mediterranean Lands (3L-1s; 3L-1s)
505. Reading Course in Meteorology—Staff
506. Scandinavia—W. C. Wonders (3-1s; 3-1s)
508. Land Use Analysis and Planning—P. J. Smith (1-2s; 1-2s)
510. Historical Geography—Staff (1-2s; 1-2s)
512. Advanced Urban Geography—P. J. Smith (3s-0; 3s-0)
525. Field School in Geography—Staff
541. Cartographic Design and Editing—J. J. Klawe
542. Latin America—J. F. Bergmann
544. Africa—S. I. Smith
548. The Tropical World
550. Research in Regional Geography—Staff
551. Research in Physical Geography—Staff
552. Research in Human Geography—Staff
553. Special Problems—Staff
555. Research in Meteorology—Staff
558. Transportation Geography—E. C. Chapman
561. Water Resources—A. H. Laycock
580. Seminar on Geography of Settlement—W. C. Wonders
630. Research in Regional Geography
631. Research in Physical Geography
680. Research in Human Geography
690. Seminar on Geographic Thought
696. Special Problems

Meteorology

1. The Department of Geography offers the M.Sc. in Meteorology. The program will be prepared under the regulations for the Master's Degree, with the language requirement of a reading knowledge of a modern foreign language other than English. Prerequisite to this program is an Honors B.Sc. degree or equivalent, with adequate preparation in mathematics and physics. Prospective candidates should write and inquire of the Department concerning their interests and their background.
2. The program of study will include four courses in Meteorology, which should include Meteorology 405, 511, 514 and 515. If the candidate has no course in Statistics, he should also include an introductory course in statistics.
3. A second program leading to an M.Sc. degree, given with the co-operation of the Meteorology Branch, Department of Transport, requires 20 months

of study. The first academic year will include Meteorology 405, 511, 512, 513, 514, 515, an introductory course in statistics and seminar. There will be no foreign language requirement for this degree. During the second year, a student will take Meteorology 525, 505 or other acceptable course, and prepare a thesis.

4. Undergraduate course which may be taken for graduate credit.

Meteorology 405. Introduction to Theoretical Meteorology (3-0; 3-0)
A study of the physics of the atmosphere, including thermodynamics, stability, radiation, equations of motion, friction, and some reference to turbulence.

5. *Graduate Courses*

Meteorology 505. Reading Course in Meteorology

Meteorology 511. Synoptic Meteorology (3-0; 3-0)
Structure of the Atmosphere. The structure and behaviour of weather systems. Planetary Scale Motion Systems. Jet streams. Vertical Motion. Condensation Phenomena. Meso-scale Phenomena.

Meteorology 512. Synoptic Meteorology Laboratory (0-4; 0-4)
A complementary course to Meteorology 511. Analysis of surface and upper air charts, and cross sections. Forecasting methods. Prognosis by graphical and computer methods.

Meteorology 513. Physical Meteorology (2-0; 2-0)
Atmospheric Radiation. Solar and Terrestrial Radiation. Radiation Calculation. Physics of Clouds and Precipitation. Radar Meteorology. Atmospheric Electricity. The Stratosphere and higher layers of the atmosphere.

Meteorology 514. Climatology (3-0; 0-0)
The General Circulation. Climatic classification. Climates of the Continents. Climate and hydrology. Climatic Change. Microclimatology.

Meteorology 515. Meteorological Statistics (0-0; 3-0)
Application of Statistics to Meteorology. Fourier Analysis of Time series. Power spectrum Analysis and Stochastic processes.

Meteorology 525. Advanced Topics in Dynamic Meteorology (3-0; 3-0)
Elements of numerical weather prediction. Atmospheric turbulence and diffusion. Atmospheric energy and energy transformation. Mathematical models.

Meteorology 555. Research in Meteorology

GEOLOGY

1. The Department of Geology offers graduate work to the level of the Doctor's degree. The M.Sc. or Ph.D. degree may be obtained by passing satisfactorily a suitable program of studies in addition to the presentation of a thesis.
2. The fields of study open for research in the Department are: mineralogy, petrology, geochemistry, geochronology, paleontology, stratigraphy, sedimen-

tation, economic geology, geomorphology, glacial geology and structural geology. Teaching assistantships are available for qualified students.

3. *Graduate Courses*

501. Advanced Structural Geology—H. A. K. Charlesworth (0-0; 3-0)

502. Sedimentary Petrology and Sedimentation—J. Lerbekmo (2s-0; 2s-0)

503. Advanced Stratigraphy—C. R. Stelck, D. E. Jackson (3-3; 3-3)

507. Advanced Metamorphic Petrology—R. A. Burwash* (0-0; 3-3)

508. Precambrian Geology—R. A. Burwash† (3-3; 0-0)

510. Advanced Mineralogy—H. Hall (3-0; 3-0)

511. Regional Structural Geology—H. A. K. Charlesworth (0-0; 3-3)

512. Pleistocene Geology—J. A. Westgate (3s-0; 0-0)

513. Field Work in Geomorphology and Glacial Geology—A. J. Broscoe, J. A. Westgate One day of field work each week (½-year course

514. Rock Analysis—H. Baadsgaard (1-3; 0-0) or (0-0; 1-3)

515. Advanced Micropaleontology—J. H. Wall (2-4; 0-0) or (0-0; 2-4)

516. Advanced Paleontology (0-0; 3s-0) or (3s-0; 0-0)
C. R. Stelck and D. E. Jackson

517. Advanced Geochemistry—H. Baadsgaard (0-0; 3s-0)

518. Paleontology of the Lower Vertebrates—R. C. Fox (3-3; 0-0)

519. Paleontology of the Higher Vertebrates—R. C. Fox (0-0; 3-0)

609. Geological Research—Members of the Department

610. Isotope Geology—H. Baadsgaard (0-0; 2-0)

611. Palynology—C. R. Stelck (3s-3; 0-0) or (0-0; 3s-3)

612. Ore Deposits—R. E. Folinsbee (3s-3; 0-0)

613. Mineralogy Seminar—H. T. Hall (0-0; 3s-0)

620. Problems in Vertebrate Paleontology (1-0; 1-0)

GERMANIC LANGUAGES

1. The Department of Germanic Languages and General Linguistics offers graduate work leading towards the M.A. and Ph.D. degrees in various areas of German literature and Germanic linguistics and philology. Studies leading toward the M.A. and Ph.D. in General Linguistics are described under Linguististic Studies.

2. The German collection in the University Library is fully adequate for purposes of advanced research in a number of areas in German literature and Germanic linguistics and philology, and it is being expanded very rapidly. For students engaged in specific research projects, essential materials will be acquired. In addition, the University's *Georg Kaiser Collection* offers a rare opportunity for research into the life and work of this author, using photocopies of original material much of which is still unpublished.

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*Alternate years only, not given 1966-67.

†Alternate years only, given 1966-67.

3. The attention of prospective candidates is directed to the general regulations of the Faculty of Graduate Studies. Inquiries regarding individual programs should be directed to the Head of the Department.
4. Graduate Teaching Assistantships, Graduate Service Assistantships and Graduate Research Assistanships are available to qualified students. For details please see Awards and Financial Assistance.
5. *Graduate Courses*

German Language and Literature

500. Special Reading Course

Specifically designed for graduate students who wish to prepare themselves for the Ph.D. language requirement in German. The course consists of an intensive study of essential grammar, reading of graded tests and translation of texts selected from the students' own fields. Conducted on a tutorial basis.

Graduates who obtain a mark of 65% (grade point 6 under the new system) or better will be considered by the Department as having fulfilled the reading requirement in German for the Ph.D. at the University of Alberta.

510. Advanced German Composition and Conversation (2-0; 2-0)
595. Bibliography and Methodology (3-0; 3-0)
600. An Introduction to the Study of Lyric Poetry; Goethe's Poems (3-0; 3-0)
603. German Poetry from the Twelfth to the Nineteenth Century (3-0; 3-0)
606. The Development of German Drama (3-0; 3-0)
609. Development of the German Novelle, with Emphasis on the Nineteenth Century (3-0; 3-0)
610. Middle High German Literature (3-0; 3-0)
612. The German Roman from Johann Fischart to Jacob Wasserman (3-0; 3-0)
615. History of German Literature to the Age of Goethe (3-0; 3-0)
630. Lessing and the Period of Enlightenment (3-0; 3-0)
640. Goethe's Faust and the Faust Legend (3-0; 3-0)
650. Schiller's Historical Dramas (3-0; 3-0)
660. Heinrich Heine and the Young Germany Movement (3-0; 3-0)
670. The German Drama of the Nineteenth Century (3-0; 3-0)
680. The Life and Works of Gerhart Hauptmann (3-0; 3-0)
690. Contemporary German Poetry (3-0; 3-0)
698. Special Topics in German Literature (3-0; 3-0)
699. Conference Course

Germanic Linguistics and Philology

540. Old High German (3-0; 0-0)
550. Gothic (3-0; 0-0)

560. History of the German Language (0-0; 3-0)
575. Studies in Indo-European (3-0; 0-0)
580. Comparative Germanic Grammar (0-0; 3-0)
590. Old Saxon (0-0; 3-0)
697. Special Topics in Germanic Linguistics and Philology (3-0; 3-0)

Scandinavian
550. Old Icelandic Philology (3-0; 0-0)

HISTORY

1. The Department offers instruction leading to the degrees of Master of Arts and Doctor of Philosophy in European, British, Commonwealth, Canadian, American, and African history, and the Master of Arts degree in East Asian history.

2. Candidates for the Master of Arts degree who do not hold a four-year honors Bachelor of Arts degree in history, or an equivalent degree (in the case of foreign students), must pass a set of comprehensive, written examinations in three broad fields of history (incorporated in the 500 level courses listed below) before proceeding with their graduate programme. The examinations, offered once in each term, are the same as those written by candidates for the Bachelor of Arts honors degree in history. Preparation for these examinations normally requires one academic year. Students who hold the Bachelor of Arts degree with honors in history, or an equivalent degree, proceed directly to the work of their master's thesis. All candidates for the Master of Arts degree must demonstrate a reading knowledge of either French or German, or in special cases, another foreign language closely related to the studies of the degree programme.

3. Provisional candidates for the Doctor of Philosophy degree, before they may proceed to candidacy examinations, must demonstrate a reading knowledge of French, German, or Russian, and one additional language acceptable to the Department. At least one language examination must be attempted in the first year of the degree programme.

   Provisional candidates, before admission to candidacy for the doctorate, must pass written examinations in three special fields and an oral examination in the general field of the thesis, as determined by the Department. The examinations are designed to test specific knowledge of fact interpretation, and bibliography, as well as general competence in historical methodology.

4. History 602 is required of all candidates for higher degrees who have not already taken an equivalent course. Candidates normally register in courses of the 500 or 600 level, which essentially consists of tutorial instruction and private study. Those who require additional background work may, however, enrol in 400 level courses as listed in the calendar of the Faculty of Arts. It is stressed that students who lack prerequisite training in given areas of study will be required to do needed preparatory work befor being allowed to proceed with the normal work of 500 and 600 level courses.

5. Provisional candidates for the doctoral degree normally register for at least three units of courses numbered in the 600's (in addition to History 602) in preparation for the written and oral candidacy examinations.

6. The Department offers no graduate courses extramurally, nor in the Evening Credit Programmes, nor in the Summer Session.

7. The programme of graduate studies in the Department is described in more detail in a supplement to the calendar entitled *Higher Degrees in History,* issued annually by the Department.

8. *Honors and Graduate Courses; primarily for Master of Arts candidates not holding the Bachelor of Arts degree with honors (or its equivalent).*

Prerequisite: Previous study in the area of each course.

511. Medieval British History (Comprehensive) (3-0; 3-0)
512. Modern British History (Comprehensive) (3-0; 3-0)
513. Canadian History (Comprehensive) (3-0; 3-0)
514. American History (Comprehensive) (3-0; 3-0)
515. Medieval European History (Comprehensive) (3-0; 3-0)
516. European History, 1500-1789 (Comprehensive) (3-0; 3-0)
517. European History, since 1789 (Comprehensive) (3-0; 3-0)
518. Russian and East European History (Comprehensive) (3-0; 3-0)
519. British Empire and Commonwealth History (Comprehensive) (3-0; 3-0)
520. East Asian History (Comprehensive) (3-0; 3-0)
521. African History (Comprehensive) (3-0; 3-0)

9. *Graduate Courses*

Prerequisite: Previous study in the area of each course.

600. Conference Course

Directed studies in special subjects to meet individual requirements.

602. Philosophy of History and Historical Methodology (3-0; 3-0)

This course, or its equivalent, is reqiured of all candidates for higher degrees in history.

605. Research Seminar (3-0; 0-0)and/or(0-0; 3-0)

The specific area of research is announced by the Department in the term before the seminar is offered.

The following courses are designed to give the student an opportunity to prepare for the doctoral candidacy examinations.

621. Medieval Europe (3-0; 3-0)
623. Early Modern Europe (3-0; 3-0)
625. Modern Europe (3-0; 3-0)
652. Medieval England (3-0; 3-0)
654. Tudor and Stuart England (3-0; 3-0)
656. Modern Britain (3-0; 3-0)
658. British Empire and Commonwealth (3-0; 3-0)

660. American History since 1607 (3-0; 3-0)

670. Canada (3-0; 3-0)

680. East Asia (3-0; 3-0)

685. Africa (3-0; 3-0)

HOUSEHOLD ECONOMICS

1. Graduate work leading to the degree of Master of Science may be undertaken in the School of Household Economics. The major work may be done only in the field of nutrition. At present research work in the department is centred around the lipids.
2. A candidate may normally expect to take two academic years plus one summer to fulfill the requirements. For students proceeding from a general undergraduate program, six courses plus a thesis are required. When the thesis undertaken is a major piece of work, the number of courses may be reduced.
3. Programs may include Household Economics 500, 502, (or 502 and 503), and courses from other departments such as: Animal Science 512; Biochemistry 511, 521, 531, 561; Biometrics 455, 604; Chemistry 312, 370, 450; Pharmacy 501, 502; Food Chemistry 474, 475, 671, 672; Physiology 400, 401.
4. Undergraduate courses which may be taken for graduate credit.

458. Nutrition—Staff 3-3; 3-3)

5. *Graduate Courses*

500. Seminar—Staff (1s-0; 1s-0)

502. Research Project in Nutrition—Staff (3L; 3L)

503. Further Research Project in Nutrition—Staff (3L; 3L)

INDUSTRIAL AND VOCATIONAL EDUCATION

1. The Department of Industrial and Vocational Education offers programs leading to the M.Ed. degree in Industrial Arts and in Vocational Education.
2. The work of this Department is closely coordinated with that of other Departments in the Faculty of Education and with other faculties and schools of the University.
3. Graduate programs in Industrial Arts and in Vocational Education normally include both professional courses in education and senior or graduate courses offered by other faculties and schools in the University.
4. Before a student can be admitted as a candidate for the M.Ed. degree, his record must be acceptable to the Faculty of Graduate Studies and to the Department. The prospective candidate should first consult the Head of the Department of Industrial and Vocational Education who, together with other members of the staff, will plan an appropriate program.
5. A number of assistantships are available to well-qualified candidates for the M.Ed. degree.
6. *Graduate Courses*

Industrial Arts Education

Ed.I.A. 589. Organization of Industrial Arts Education—Staff (3-0; 0-0)

Ed.I.A. 591. Problems and Trends in Industrial Arts Education—Staff (0-0; 3-0)

Ed.I.A. 594. Research and Development Seminar in Industrial Arts Education—Staff (3-0; 3-0)

Vocational Education

Ed.Voc. 550. Vocational Guidance—Conference Seminar (1-3; 1-3)

Ed.Voc. 589. Organization of Vocational Education—Staff (3-0; 0-0)

Ed.Voc. 591. Problems and Trends in Vocational Education—Staff (0-0; 3-0)

Ed.Voc. 594. Research and Development Seminar in Vocational Education—Staff (3-0; 3-0)

MASTER OF LAWS

1. Candidates who are graduates of this or some other university with an LL.B. or equivalent degree and who meet the requirements for admission to the Faculty of Graduate Studies in other respects, may be admitted to a program of study in the Faculty of Law leading to the degree of Master of Laws.
2. The program of study, which must be approved by the Dean of the Faculty of Law, will include both courses and research, a minimum of four course hours per week for two terms being required in the ordinary case. A thesis is required in addition to the course work and research. Courses of study are available only in specialized fields. Inquiry should be addressed to the Faculty of Law as to which courses will be offered in any year.
3. Those qualified in law in other legal systems than the common law may pursue a comparable program of studies in petroleum law leading to the Diploma in Petroleum Law awarded by the Faculty of Law. Particulars may be found in the calendar of the Faculty of Law.
4. The general regulations for graduate studies and, in particular, the regulations governing fees, scholarships and assistantships, admission and thesis requirements are set out in the calendar of the Faculty of Graduate Studies.

4. *Graduate Courses*

590. Seminar in Advanced Problems in Constitutional Law (2-0; 2-0)
A. Smith

591. Seminar in Problems in Oil and Gas Law—A. R. Thompson (2-0: 2-0)

592. Seminar in International Law—Ivan L. Head (2-0; 2-0)

International Law—

594. Seminar in Comparative Law—S. P. Khetarpal (2-0; 2-0)

601. Seminar in Comparative Petroleum Legislation (2-0; 2-0)
A. R. Thompson

LINGUISTIC STUDIES

Graduate programs in linguistic or philological studies centering on a specific language will normally be arranged with and administered by the department most directly concerned. Programs in General Linguistic Studies leading toward M.A. and Ph.D. degrees and involving concentration in such fields as general, descriptive and applied linguistics will be arranged with and ad-

ministered by an Interdepartmental committee comprised of representatives of the Departments of Classics, English, Germanic Languages and General Linguistics, Romance Languages, Slavonic Languages, Sociology and Anthropology, and the Faculty of Education.

Students admitted to a program in General Linguistic Studies must possess as a prerequisite proficiency in two languages other than English. Special cases may be considered by the Committee.

All students will be required to complete an integrated program of study and to submit a thesis based on research in a chosen and approved field of investigation.

For additional information regarding such programs, including the availability of assistantships, scholarships, research grants, etc., students should consult the secretary of the Interdepartmental Committee, c/o Department of Germanic Languages and Linguistics, University of Alberta, Edmonton. Such inquiries should be made as early as possible, particularly by students who wish to begin their program by taking courses in the Summer School of Linguistics.

The following courses, which are at present offered by member departments, may be taken for graduate credit:

Applied Linguistics

Education—

*340.	**Teaching English as a Second Language**	(10-0)
*380.	**Curriculum and Instruction in the Secondary School (Latin)**	(10-0)
456.	**Curriculum and Instruction (English)**	(3-0; 3-0)
460.	**Advanced Curriculum and Instruction in Secondary School Foreign Languages**	(3-0; 3-0)
538.	**Program Development in Elementary School Language**	(3-0; 3-0)
680.	**Graduate Seminar on the Teaching of French in the Secondary School**	(3-0; 3-0)
680.	**Graduate Seminar on the Teaching of (English) Language and Literature in the Secondary School**	(3-0; 3-0)

Linguistics—

370.	**Contrastive Linguistics (French-English)**	(3-0; 3-0)
372.	**Contrastive Linguistics (German-English)**	(3-0; 3-0)
374.	**Contrastive Linguistics (Russian-English)** (Also listed as **Russian 374**)	(3-0; 3-0)
405.	**Applied Linguistics**	(3-0; 3-0)

Classics

Latin—

506.	**Sanskrit**	(3-0; 3-0)
514.	**Comparative Philology and Syntax**	(3-0; 3-0)
531.	**History of the Latin Language**	(3-0; 0-0) or (0-0; 3-0)
534.	**Medieval Latin**	(3-0; 0-0) or (0-0; 3-0)

Greek—

521. History of the Greek Language (3-0; 0-0) or (0-0; 3-0)

522. Greek Epigraphy (3-0; 0-0) or (0-0; 3-0)

English

English—

308. Old English Language and Literature (3-0; 3-0)

388. History of the English Language (3-0; 3-0)

576. Study of Language (3-0; 3-0)

592. Old Norse and Germanic Philology (3-0; 3-0)

610. Old English (3-0; 3-0)

General Linguistics

Linguistics—

305. Culture and Language (3-0; 3-0)

350. General Linguistics (3-0; 3-0)

***387. Linguistic Geography** (10-0)

389. Modern English Grammar (3-0; 3-0)

***440. Cree Phonology and Structure** (10-10)

***450. Eskimo Language and Culture** (10-10)

455. Descriptive Linguistics (3-0; 3-0)

465. Historical Linguistics (3-0; 3-0)

470. American Indian Linguistics (3-0; 3-0)

550. Advanced Phonetics and Field Methods (3-0; 3-0)

695. Transformational Grammar (3-0; 3-0)

699. Conference Course

An honors or graduate course designed to meet the needs of individual students.

Germanic Languages

German—

540. Old High German (3-0; 3-0)

550. Gothic (3-0; 3-0)

560. History of the German Language (0-0; 3-0)

575. Studies in Indo-European (3-0; 0-0)

580. Comparative German Grammar (0-0; 3-0)

590. Old Saxon (0-0; 3-0)

697. Special Topics in Germanic Linguistics and Philology (3-0; 3-0)

Scandinavian—

550. Old Icelandic Philology (3-0; 0-0)

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*Courses marked with an asterisk are at present available only in the Summer School of Linguistics. Some may be offered only at infrequent intervals.

Romance Languages

French—

601. History of the French Language (3-0; 3-0)

Spanish—

540. History of the Spanish Language (3-0; 3-0)

Romance Linguistics—

500. Phonology: Synchronic and Diachronic (3-0; 3-0)

505. Comparative Romance Linguistics (3-0; 3-0)

Slavonic Languages

Russian—

420. History of the Russian Language (3-0; 3-0)

Slavonics—

520. Old Church Slavonic (3-0; 3-0)

540. Contrastive Slavonic Linguistics (3-0; 3-0)

550. Seminar in Slavonic Linguistics (1-0; 1-0)

MATHEMATICS

1. The Mathematics Department offers graduate programs in a number of fields including algebra, classical analysis, functional analysis, approximation theory, numerical analysis, combinatorial analysis, differential geometry, number theory, tensor analysis, relativity, quantum field theory, continuum mechanics, and mathematical statistics.
2. Graduate teaching assistantships involving at most twelve hours per week of class preparation, and marking time are available for candidates working towards a higher degree.
3. Courses taken in other departments will depend upon the field of interest of the candidates. Courses in Physics may include 480, 470, 520, 510, 550 or 570 or Astronomy 410.
4. Candidates for the M.Sc. degree must satisfy the Department that they have competence in reading one of the following foreign languages: French, German, and Russian.

   Ph.D. candidates must satisfy the Department that they have a reading knowledge in two of French, German, and Russian.
5. The normal M.Sc. degree requirements for candidates with an Honors Mathematics degree or equivalent may be completed in a minimum of one full year, and consist of a thesis in one of the fields mentioned above, and a minimum of two graduate courses at least one of which must be in the Department of Mathematics.

   M.Sc. candidates entering from a pass degree in the Mathematics pattern will require a minimum of two academic years to complete at least six courses and a thesis.
6. Candidates for the Ph.D. degree will spend at least two years from the completion of the M.Sc. degree in advanced study and research. The major requirement is a substantial contribution to knowledge, embodied in a thesis.

In addition to the examinations required by the general regulations, a Ph.D. pre-candidacy examination will be required within approximately twelve months of becoming a provisional candidate. (Normally a student is not accepted as a provisional candidate until he has the equivalent of the M.Sc. degree at the University of Alberta.)

7. Prospective students should consult both the head of the department and the staff member in charge of the field in which they are particularly interested.

Mathematical Physics

The Master of Science and Doctor of Philosophy degrees in Mathematical Physics may be taken in the Mathematics department by a student with a good background in both Mathematics and Physics. Candidates with an Honors degree in Mathematics will be required to write a thesis on some topic in the field of theoretical, rather than experimental Physics, or in Applied Mathematics.

The program of graduate courses will be selected in consultation with the heads of the departments of Mathematics and Physics.

Candidates who have a B.Sc. in the Mathematics pattern of the general course, with three or more courses in Physics, may be accepted for a two-year M.Sc. program in Mathematical Physics. The general conditions of paragraph five above will apply.

Statistics

The Master of Science and Doctor of Philosophy degrees in Mathematical Statistics may be taken in the Mathematics department.

Candidates for the M.Sc. degree with an Honors degree in Mathematics will be required to take at least two graduate courses in theoretical statistics and to write a thesis on some topic in this field.

Candidates with a B.Sc. in the Mathematics pattern of the general course may be accepted for a two-year M.Sc. program if their pattern has included Statistics 255, and Statistics 450 or their equivalent. The general conditions of paragraph five above will apply.

Honors and Graduate Courses

A selection of courses, depending on demand, will be made from the following list:

Mathematics

500. Theory of Functions of a Complex Variable	(3-0; 3-0)
501. Theory of Functions of a Complex Variable	(3-0; 3-0)
502. History of Mathematics	(3-0; 3-0)
505. Foundations of Analysis	(3-0; 3-0)
510. Abstract Algebra II	(3-0; 3-0)
515. Number Theory	(3-0; 3-0)
520. Differential Geometry	(3-0; 3-0)
522. Partial Differential Equations	(3-0; 3-0)
541. Real Variables II	(3-0; 3-0)

550. Generalized Dynamics and Special Relativity Theory	(3-0; 3-0)
554. Theory of Elasticity	(3-0; 3-0)
555. Hydro- and Aero-dynamics	(3-0; 3-0)
580. Tensor Analysis	(3-0; 3-0)
600. Analysis. Special Functions	(3-0; 3-0)
604. Measure Theory	(3-0; 3-0)
605. Mathematical Logic	(2-0; 2-0)
610. Calculus of Finite Differences	(3-0; 3-0)
615. Integral Equations	(3-0; 3-0)
616. Topics in Functional Analysis	(3-0; 3-0)
620. Advanced Complex Analysis	(3-0; 3-0)
621. Ordinary Differential Equations (Advanced)	(3-0; 3-0)
624. Combinatorial Analysis	(3-0; 3-0)
625. Analytic Number Theory	(3-0; 3-0)
630. General Topology	(3-0; 3-0)
631. Algebraic Topology	(3-0; 3-0)
645. Lattice Theory	(3-0; 3-0)
670. Topics in Algebra	(3-0; 3-0)
671. Topics in Analysis	(3-0; 3-0)
672. Topics in Geometry	(3-0; 3-0)
673. Topics in Applied Mathematics	(3-0; 3-0)
691. Group Theory	(3-0; 3-0)
695. Advanced Relativity Theory	(3-0; 3-0)

Physics

680. Advanced Quantum Mechanics	(3-0; 3-0)
682. Advanced Electromagnetic Theory	(3-0; 3-0)
685. Advanced Statistical Mechanics	(3-0; 3-0)
688. Advanced Solid State Theory	(3-0; 3-0)
690. Quantum Theory	(3-0; 3-0)
692. Group Theory and Applications	(3-0; 3-0)
697. Nuclear Structure	(3-0; 3-0)
699. Selected Topics in Theoretical Physics	(2-0; 2-0)

NOTE: The above courses are given in the Physics Department. Some of these may be selected as part of a graduate program in Mathematics.

Statistics

560. Estimation and Statistical Hypotheses	(3-0; 3-0)
562. Theory of Games	(2-0; 2-0)
564. Analysis of Variance	(3-0; 3-0)
565. Mathematical Methods of Statistics	(2-0; 3-0)
570. Probability Theory and Applications	(2-0; 2-0)

660. Stochastic Processes (2-0; 2-0)

674. Topics in Statistics (3-0; 3-0)

MECHANICAL ENGINEERING

1. Programs and facilities are available for qualified graduates of recognized universities to carry out graduate study and research in Applied Mechanics, Thermodynamics, Heat Transfer and Combustion Engineering leading to an M.Sc. degree. Facilities and research opportunities are also available to well qualified students to carry out a program leading to a Ph.D. in Applied Mechanics. Individual programs will be arranged in consultation with the Head of the Department and an advisory committee selected from the Department.
2. The normal requirements for a Master's degree are credit in courses equivalent to 24 term hours, 12 of which must be in the candidate's major field, plus a thesis equivalent to 12 term hours.
3. For the Ph.D. program, all requirements of the Faculty of Graduate Studies must be met. In addition the Department normally requires that the candidate must have satisfactorily completed approved courses in the major and in at least one minor field. The minimum requirements after the Bachelor's Degree are courses equivalent to 24 term hours in the major field and 12 term hours in a single minor field or a total of 14 term hours in two minor fields. As part of the requirements for demonstrating competence for admission to candidacy for the Ph.D. the students must pass the departmental comprehensive examinations embracing the major fields. These examinations may be either written or oral. The examinations will be arranged for in consultation with the Department, but will generally not be permitted until the student has completed one year of graduate work and has satisfied one of the foreign language requirements.
4. To the limit of its facilities the Department is prepared to accept qualified graduates from recognized universities. Graduates from fields other than Mechanical Engineering may be accepted under special arrangement.
5. Financial assistance is available through part-time teaching assistantships. Limited travel grants are available to teaching assistants. The student should also note the availability of various scholarships listed under Awards and Financial Assistance.
6. Undergraduate courses which may be taken for graduate credit.

Engineering Mechanics—

452. Mechanical Vibrations (0-0; 3-0)

460. Mechanics of Solids (0-0; 3-0)

Mechanical Engineering—

436. Applied Gas Dynamics (0-0; 3-0)

440. Thermodynamics II (0-0; 3-0)

462. Principles of Design (2-3/2; 0-3)

471. Heat Transfer II (0-0; 3-0)

7. *Graduate Courses*

Engineering Mechanics—

551. Theory of Elasticity	(3-0; 0-0)
552. Dynamics of Structures	(0-0; 3-0)
554. Theory of Elastic Stability	(0-0; 3-0)
555. Theory of Plasticity	(3-0; 3-0)
556. Theory of Plates	(3-0; 0-0)
557. Theory of Shells	(0-0; 3-0)

600-604. Reading Projects in Engineering Mechanics
Max. of 6 hrs. credit in any project

Mechanical Engineering—

520. Advanced Combustion Engineering	(2-3/2; 0-0)
521. Advanced Combustion Engineering (Design)	(0-0; 2-3/2)
535 Gas Dynamics I	(3-0; 0-0)
536. Gas Dynamics II	(0-0; 3-0)
540. Thermodynamics III	(3-0; 0-0)
570. Conduction Heat Transfer	(3-0; 0-0)
572. Convective Heat Transfer	(0-0; 3-0)
573. Turbulent Convection	(0-0; 3-0)
575. Thermal Radiation	(0-0; 3-0)

MEDICINE

There are facilities in the Department of Medicine to permit graduate students to proceed to Master of Science degrees. Course work in required, together with a thesis dealing with some fundamental aspect of Medicine, the degree to be awarded in Experimental Medicine. Fellowships are available on an annual basis but applications for these must be received by the Departmental Head approximately 12 months in advance. A year of research leading to the award of an M.Sc. degree may be taken as part of one of the four year courses leading to specilization within the field of Medicine.

MICROBIOLOGY

The department offers programs of research and course work leading to the M.Sc. and Ph.D. degrees. Research in the department is currently being conducted in such areas as: viral and bacterial ultrastructure, bacterial taxonomy and nutrition, microbial and mammalian virus replication and transformation, immunology.

Teaching assistantships and demonstratorships as well as financial assistance from research grants to faculty members are available for a number of qualified candidates.

Courses offered by the Department of Microbiology may be augmented by suitable courses from other departments (for example, Dairy and Food Science, Biochemistry, Botany, Zoology, Bacteriology, Genetics and Soil Science) to develop programs suited to the applicant's interest and background. All graduate programs must be approved by the Head of the Department.

Graduate Courses

Microbiology 503. Microbiology.
A directed studies program of reading and supervised experiments, with the presentation of written and oral reports at the end of the course.

Microbiology 505. Advanced Microbial Physiology (3-0; 0-0)or(0-0; 3-0)
Members of the Department

Microbiology 507. Advanced Microbiology Seminars (1S-0; 1S-0)
Members of the Department

Microbiology 508. Advanced Virology (3-0; 0-0)or(0-0; 3-0)
Members of the Department

Microbiology 509. Current Concepts in Immunology (0-0; 3-0)or(3-0; 0-0)
Members of the Department

N.B.—Not all graduate courses are offered every year.

MINING AND METALLURGY

The Department of Mining and Metallurgy offers graduate work in the fields of Mineral Dressing, Hydrometallurgy, Pyrometallurgy and Physical Metallurgy. Graduate programs in these fields, leading to the degrees of M.Sc. and Ph.D. in Metallurgy and M.Sc. and Ph.D. in Metallurgical Engineering, may be arranged.

Graduates in the basic Sciences or Engineering are eligible to apply for registration in these programs in Metallurgy or Metallurgical Engineering.

Graduate programs at the M.Sc. level are available in Mining Engineering and graduates in Engineering are eligible to apply.

The Department is well equipped and has available a variety of research projects suitable for studies at the Master's or Doctoral level.

Graduate courses offered in the Department are as follows:

Metallurgical Engineering—

500. Metallurgical Thermodynamics
501. Kinetics of Metallurgical Processes
502. Advanced Crystallography
***503. Corrosion**
504. Flotation
505. Hydrometallurgy
506. Research Techniques in Metallurgy
507. Lattice Imperfections and the Mechanical Behavior of Solids (3-0; 3-0)

NOTE: The Department reserves the right to offer only those graduate courses for which a sufficient number of students register.

PAEDIATRICS

Facilities exist within the Department of Paediatrics for students who wish to proceed to the M.Sc. Degree.

Inquiries should be directed to the Head of the Department of Paediatrics, University Hospital.

*A course in chemical thermodynamics and a course in physical metallurgy are prerequisites for Met.E. 503 (Corrosion).

PATHOLOGY

1. Facilities are available for graduate training and research leading to the M.Sc. degree in Medical Laboratory Science.
2. The M.Sc. program can be entered by graduates of the M.Sc. course in Medical Laboratory Science and certain other B.Sc. graduates in which case the period before submission of the thesis will normally be two years, and by graduates in Medicine, in which case the period will normally be twelve months. Programs will include graduate courses, seminars, and pursuit of an approved research problem.
3. Courses prerequisite for the M.Sc. program can be specified only at the time of arrangement of the candidate's program, although some biological sciences, particularly Microbiology, Biochemistry and Physiology should have been studied.
4. Graduate and undergraduate courses offered by the Departments of Anatomy, Biochemistry, Physiology, Pharmacology and Plant Science may be included in the candidate's program. Courses offered by other departments or faculties may be approved under certain circumstances.
5. *Graduate Courses*

501. Cellular and Tissue Structure and General Mechanisms of Disease—Staff (3-2; 3-2)

502. Reticuloendothelial System and Immunity—G. O. Bain (3-0; 0-0)

503. Advanced Hematology—R. E. Bell and Staff (0-0; 3-0)

504. Seminars on General Pathology—Staff (1-0; 0-0)

505. Fundamentals of Histochemistry—T. K. Shnitka (1-2; 0-0)

610. Subcellular Morphology—T. K. Shnitka (0-0; 2-0)

NOTE: Not all graduate courses are offered every year. The head of the Department should be consulted regarding the availability of graduate courses in any academic session.

PHARMACOLOGY

1. Facilities are available for graduate training in research leading to the M.Sc. and Ph.D. degrees. The staff of the Department are orientated towards experimental pharmacology with emphasis on both physiological and biochemical approaches to the pharmacology of smooth muscle, and the nervous and cardiovascular system. Techniques available include electrophysiological recording, radioactive tracers, spectrophotometric assays, photofluorometric assays, isolation of cell fractions and chemical syntheses. In addition, training in Clinical Pharmacology is offered in conjunction with the Department of Medicine and the University Hospital.
2. A program has been arranged for graduates in Medicine wishing to spend a year in a basic science department. The program includes graduate courses, a weekly seminar, duties as class laboratory demonstrator, participation in a research project and optional attendance at undergraduate lectures This training does not lead to a degree, but may satisfy some of the course requirements for an M.Sc. should the candidate decide to undertake a research project leading to a thesis. Students not intending to proceed to a

graduate degree should register as special students in the Faculty of Medicine.

3. Graduate studies in Pharmacology may be of interest to candidates with degrees in general biology, psychology, physics, chemistry, biochemistry, physiology, bacteriology, pharmacy, medicine and dentistry. Prerequisite courses will be specified at the time of arrangement of the candidate's program. The time required for completion of graduate programs will vary with previous training of the individual and will ordinarily be less for those entering with an honors degree or a degree in Medicine or Dentistry.
4. Graduate and undergraduate courses offered by other departments may be included in a candidate's program by arrangement between the departments concerned.
5. Financial support of the candidate can be arranged. Teaching and Research Fellowships are available to graduate students; applications for these should be received before March 15 of each year.
6. *Graduate Courses*

501. Tutorial and Reading Course—Staff (Credit 4 hrs.)

502. Methodology in Pharmacology (0-3; 0-3)
D. P. MacLeod , J. D. Taylor

***503. Bioassays**—G. B. Frank, J. D. Taylor (0-0; 1-6)

***504. Pharmacological Aspects of Autonomic Transmittor Substances**—C. W. Nash (0-0; 3-0)

***505. The Relationship Between Chemical Structure and Pharmacological Activity**—G. S. Marks (0-0; 3-0)

***506. Neuropharmacology**—R. J. Reiffenstein (0-3; 0-0)

***507. The Actions of Drugs on Skeletal Muscle and Neuromuscular Transmission**—G. B. Frank (3-0; 0-0)

***600. Seminar**—Staff and graduate students (0-0; 1s-0)

***601. The Actions of Drugs on Membrane Potentials and Ion Fluxes of Smooth Muscle**—E. E. Daniel (0-0; 3-0)

†**602. Research Methods in Clinical Pharmacology**—W. A. Mahon (0-4; 0-4)

***603. Cellular Pharmacology and Receptor Theory**—G. B. Frank (3-0; 0-0)

PHARMACY

1. The Faculty of Pharmacy offers programs leading to the M.Sc. and Ph.D. degrees and can accommodate a limited number of graduate students in modern well-equipped laboratories.
2. Research may be undertaken in fields such as pharmaceutical chemistry, biopharmacy, pharmacognosy, pharmaceutics and biochemical studies with radioactive tracers. Financial assistance is available from the Canadian Foundation for the Advancement of Pharmacy, and from other sources.
3. Candidates should consult with the Dean regarding the requirements. Indi-

*Given every other year.
†Only students with the M.D. degree can be accepted in this course.

viduals with backgrounds in such fields as Pharmacy, Biological Science or Chemistry will be considered.

4. Undergraduate courses commonly accepted: Biochemistry 400, Botany 310, Chemistry 430, 450, 372, 370.

5. Undergraduate courses which may be taken for graduate credit.

440. Advanced Pharmaceutical Analysis—R. A. Locock (3-0; 3-0)

441. Advanced Pharmaceutical Analysis Laboratory (0-3; 0-3)
R. A. Locock

442. Advanced Pharmaceutics (1-0; 1-0)
A. J. Anderson and J. H. Hlynka

443. Advanced Pharmaceutics Laboratory (0-3; 0-3)
A. J. Anderson and J. H. Hlynka

6. *Graduate Courses*

501. Isotope Tracer Methodology—B. E. Riedel (3-3; 0-0)

502. Radioisotopes—B. E. Riedel (0-0; 3-3)

503. Medical Application of Radioisotopes—B. E. Riedel (0-0; 3-3)

504. Structure-Action Relationships of Organic Medicinals (3-0; 0-0)
L. G. Chatten

506. Graduate Seminar (1s-0; 1s-0)

PHILOSOPHY

1. The Department offers programs leading to the M.A. and Ph.D. degrees.

2. Good library facilities are available for the fields shown below.

3. Advanced work may be pursued in any of the following: Ethics, Aesthetics, Social Philosophy, History of Philosophy, Logic and Scientific Method. Graduate students in these fields may compete for the general graduate scholarships listed elsewhere; small sums are also available within the Department for readers.

4. Applicants for the one-year M.A. program in Philosophy must have completed training equivalent to that of graduates with honors in Philosophy from this Department. Applicants for the two-year M.A. program should consult the Department for assessment of the quantity and quality of their undergraduate training in philosophy.

5. *Graduate Courses*

502. Plato

504. Aristotle

506. St. Thomas Aquinas

510. Hegel

512. Marx and Marxism

514. Kierkegaard

516. Wittgenstein

522. Moral Philosophy

524. Political and Social Philosophy

526. Philosophy of Art

528. Philosophy of History
536. Contemporary Phenomenology
548. Conference Course
554. Theory of Value
556. Kant
558. Philosophy of Religion
560. Logic
566. Theory of Knowledge
568. Philosophy of Mind
570. Philosophy of Language
574. Seminar in Philosophy and Psychology

PHYSICAL EDUCATION

1. The Faculty of Physical Education offers a program leading to the M.A. or M.Sc. degrees. Well equipped facilities are available for a limited number of graduate students.
2. Areas of specialization include: administration, physiology of exercise, sociology, psychology of motor learning, and history.
3. Teaching and research assistantships are available to a limited number of students.
4. All arrangements must be made through consultation with the Dean of the Faculty of Physical Education.
5. *Graduate Courses*

Physical Education—

501. Research (0-6; 0-0)
503. Research (0-0; 0-6)
548. Scientific Principles of Physical Education (3-0; 3-0)
552. Administrative Problems in Physical Education and Recreation (3-0; 3-0)
564. Directed Studies (3-0; 3-0)
567. Seminar in Human Motor Performance (0-0; 3-0)
Prerequisite: Psychology 464
569. Physical Growth and Development (3-0; 0-0) or (0-0; 3-0)
578. Research Methods in Health, Physical Education and Recreation (3-3; 3-3)
588. Historical and Comparative Physical Education (3-0; 3-0)

PHYSICS

1. Programs leading to the M.Sc. and Ph.D. degrees in Physics are open to suitable graduates in Honors Physics, Engineering Physics, or equivalent courses. Individual programs will be arranged in consultation with the Head of the Department of Physics and members of the department.
2. The minimum requirements for the M.Sc. degree are one full year of study and research beyond the level of the Honors B.Sc. degree in Physics. Candi-

dates with deficiencies in this respect will be required to remedy these, and may be required to take a winter session of courses before commencing their research. All M.Sc. candidates will be required to write a comprehensive examination shortly before registration time for the purpose of having their background assessed and remedied if necessary. The program will include a minimum of two graduate courses and a research project of sufficient merit to form the basis of a thesis.

An applicant for admission to the Ph.D. program must have an M.Sc. degree from a recognized university.

An applicant having only an Honors B.Sc. degree must register as a candidate for the M.Sc. degree; should he show exceptional promise he may be considered for transfer to a Ph.D. program by the Executive Committee of the Department after a minimum period of one calendar year from the date of registration.

3. The minimum requirements for the Ph.D. degree are two full years of study and research beyond the level of the M.Sc. degree in Physics or in Theoretical Physics. The program will include a minimum of two courses and a thesis based on original research. A reading knowledge of one of French, German or Russian will be required.

   In addition to the examinations required by the general regulations, a preliminary oral examination will be required between 6 and 12 months after starting work at this university, or after completing the M.Sc., as the case may be.

4. *Theoretical Physics.* The major fields of theoretical research are: Solid state physics, physical acoustics, theoretical nuclear physics, elementary particles, field theory. An IBM 1401/7040 system is available for computational work and an IBM 360 model 67 is planned for 1967.

5. *Experimental Physics.* Research projects are available in the following fields: nuclear physics (with a 6-Mev Van de Graaf generator) low temperature and solid state physics, geophysics, mass spectrometry, precision optical spectroscopy, radiation and medical physics.

6. A number of half-time teaching assistantships are available for graduate students who have no other financial assistance. The stipends vary from $1,800 to $3,000 plus fees. Inquiries concerning assistantships should be addressed to the Head of the Department.

   In addition to the above, summer student assistantships to the value of $1,000 are available in most research projects. The attention of students is directed to the availability of the various graduate awards listed under "Awards and Financial Assistance".

7. The following undergraduate courses are offered regularly, and are available to graduate students in other departments and to students in the two-year M.Sc. program: Physics 440, 474, 480, 510, 520, 550.

8. *Graduate Courses*

516. Introductory Solid State Physics (2-0; 2-0)

540. Physical Electronics (0-0; 3-0)

560. Optics and Spectroscopy (3-0; 3-0)

570. Quantum Mechanics (3-0; 3-0)

572. Nuclear Physics (2-0; 2-0)

574. Radiation Physics (3-0; 3-0)

576. Reactor Physics (0-0; 3-0)

600. Seminar in Advanced Topics (0-1s; 0-1s)
Weekly seminars are held in each of the following fields: Theoretical Physics, Nuclear Physics, Solid State Physics, Geophysics, of which the student must select one series.

616. Low Temperature Physics (2-0; 2-0)

623. Time Sequence Analysis (3-0; 0-0)

624. Theoretical Seismology (0-0; 3-0)

625. Geomagnetism and Paleomagnetism (3-0; 0-0)

626. Stable and Radioactive Isotope Studies (3-0; 0-0)

627. Electromagnetic Boundary Value Problems in Geophysics (3-0; 0-0)

628. Topics in Solar-Terrestrial Relationships (0-0); 3-0)

660. Atomic Theory and Spectroscopy (2-0; 2-0)

662. Molecular Spectroscopy (2-0; 2-0)

672. Advanced Nuclear Physics (3-0; 3-0)

674. Experimental Topics in Nuclear Physics (3-0; 3-0)

680. Advanced Quantum Mechanics (3-0; 3-0)

682. Advanced Electromagnetic Theory (3-0; 3-0)

685. Advanced Statistical Mechanics (3-0; 3-0)

688. Solid State Theory (3-0; 3-0)

690. Quantum Field Theory (3-0; 3-0)

691. Elementary Particle Physics (3-0; 3-0)

692. Group Theory and Applications (3-0; 3-0)

697. Nuclear Structure (3-0; 3-0)

698. Modern Mathematical Concepts in Contemporary Physics (2-0; 2-0)

699. Selected Topics in Theoretical Physics (2-0; 2-0)

788. Advanced Topics in Solid State Theory (3-0; 3-0)

NOTE: In consultation with the Department of Physics certain graduate Mathematics courses may be selected as part of a graduate program in Physics.

PHYSIOLOGY

1. Facilities are available for graduate training and research leading to the M.Sc. degree. The laboratory is adequately equipped for work in the fields of cardiovascular physiology, neurophysiology, temperature regulation, haematology and certain aspects of biophysics, endocrine, respiratory and cellular physiology. A research program leading to the Ph.D. degree can also be provided in certain of these fields.
2. A program has been arranged for graduates in Medicine wishing to spend a year in a basic science department. The program includes graduate courses,

a weekly seminar, duties as class laboratory demonstrator, participation in a research project and optional attendance at undergraduate lectures. This training does not lead to a degree, but may satisfy some of the course requirements for an M.Sc. should the candidate later decide to undertake a research project leading to a thesis.

3. The M.Sc. program can be entered by graduates in Arts and Sciences, in which case the period before submission of the thesis will normally be two years, and by graduates in Medicine or Dentistry, in which case the period will normally be twelve months. In either case a comprehensive knowledge of the elements of physiology must be demonstrated before submission of the thesis. A program will include graduate courses, participation in a weekly seminar, a limited amount of teaching experience, optional attendance at undergraduate lectures and pursuit of an approved research problem.
4. Prerequisite courses can be specified only at the time of arrangement of the candidate's program, although some biological sciences should have been studied. The requisites of prime importance are a good academic standing and a desire to study biological function.
5. A modest financial support of a candidate can usually be arranged, and this is aided by early application by the student.
6. Graduate and undergraduate courses offered by the Departments of Anatomy, Biochemistry, Chemistry, Pathology, Pharmacology, Physics and Zoology may be included in the candidate's program.
7. Four teaching assistantships are available to graduate students; applications for these should be received before March 15 of each year.
8. *Graduate Courses*

501. Reflex activity of the cardiovascular system* (0-0; 3-0)
J. W. Pearce

502. Problems in Current Research—Staff (0-3; 0-3)

504. Physiology of the adrenal cortex and the gonads* (0-3; 0-0)
E. O. Höhn

505. Advanced physiological techniques*—Staff (0-0; 1-6)

506. Tutorial and Reading Course—Staff Credit 4 hrs.

509. Advanced Respiratory Physiology*—C. Heath (0-0; 3-0)

600. Seminar—Staff (1s-0;1s-0)

PLANT SCIENCE

1. The Department offers programs of course work and research leading to the M.Sc. or Ph.D. degrees. Well equipped laboratory accommodation, greenhouse, growth chamber and field facilities are available for work in horticulture, plant pathology, plant physiology and biochemistry, weed science and crop ecology.

*Offered every second year.

2. Research in the above divisions of the department concerns weeds and weed control, plant growth regulators, grassland improvement; various aspects of production of horticultural crops and ornamentals; host-pathogen relationships and protection against plant disease organisms; protein biochemistry, quality of cereals and oil-seeds, plant morphogenesis, ethylene metabolism, biochemistry of aging tissue, alkaloid metabolism.

   Financial assistance from research grants is available for a number of qualified candidates.

3. Graduate students are not required to qualify in a foreign language during preparation for the Master's degree but must do so for the doctorate.

4. Normally all relevant senior undergraduate courses are acceptable as part of the graduate program. Course requirements are based on the student's previous training and anticipated needs in the chosen field of advanced study.

5. *Graduate Courses*

Plant Science—

500. Seminar in Plant Science (1s-0; 1s-0)

Horticulture—

507. Reading Projects in Horticulture—Staff Max. of 6 hrs. credit

508. Research Projects in Horticulture—Staff Max. of 6 hrs. credit

Plant Pathology—

511. Reading Projects in Plant Pathology Max. of 6 hrs. credit
Staff

512. Research Projects in Plant Pathology Max. of 6 hrs. credit
Staff

631. Advanced Plant Pathology (0-3; 0-3)
Staff

635. Plant Pathogenesis—N. Colotelo (3-0; 0-0)
A critical review of literature related to the physiology of diseased plants, e.g., effect on growth, disintegration of tissue, wilting and changes in respiration.
Prerequisites: Plant Pathology 480 or equivalent; Plant Physiology and Biochemistry 431 and 432 or Botany 320 or equivalent.

636. Plant Pathogenesis—N. Colotelo (0-0; 3-0)
A continuation of Plant Pathology 635; histological, physiological and biochemical defense mechanisms, toxins, fungicidal action.
Prerequisites: Plant Pathology 480 or equivalent; Plant Physiology and Biochemistry 431 and 432 or Botany 320 or equivalent.

Plant Physiology and Biochemistry—

513. Reading Projects in Plant Physiology and Biochemistry—Staff Max. of 6 hrs. credit

514. Research Projects in Plant Physiology and Biochemistry—Staff Max. of 6 hrs. credit

551. Advanced Plant Biochemistry (3-0; 0-0)or(0-0; 3-0)

Mary Spencer and E. Cossins

Selected topics in plant metabolism, with emphasis on the comparative biochemistry of respiration and carbon assimilation. Evaluation of recent research and of methods of investigation in these fields.

Prerequisites: Biochemistry 300, or Plant Physiology and Biochemistry 431, 432 or consent of instructor.

(This course is identical to Plant Physiology and Biochemistry 551.)

620. Plant Morphogenesis—Saul Zalik (2-2; 2-2)

Weed Science and Crop Ecology—

501. Reading Projects in Weed Science and Crop Ecology

Max. of 6 hrs. credit

Wm. G. Corns and Wm. H. Vanden Born

502. Research Projects in Weed Science and Crop Ecology

Max. of 6 hrs. credit

Wm. G. Corns and Wm. H. Vanden Born

POLITICAL SCIENCE

1. The Department offers programmes in Political Science leading to the M.A. and Ph.D. degrees. The following areas of specialization are offered: International Politics; Political Philosophy; Canadian Government and Politics; Western European Government and Politics; Soviet Government and Politics; Political Behaviour.
2. A number of graduate assistantships are available for qualified students.
3. Students contemplating graduate work in Political Science should direct their inquiries to the Head of the Department.
4. *Graduate Courses*

Political Science—

501. Comparative Political Institutions (3s-0; 3s-0)
510. Advanced Political Thought (3s-0; 3s-0)
541. Seminar in Soviet Politics (3s-0; 3s-0)
543. Seminar in Slavonic and Soviet Studies (3s-0; 3s-0)
593. Political Behavior (3s-0; 3s-0)
600. Political Institutions (3s-0; 3s-0)
601. Federalism (3s-0; 3s-0)
603. Comparative Government (3s-0; 3s-0)
605. Systematic Study of Politics (3s-0; 3s-0)
610. Political Theory (3s-0; 3s-0)
613. Seminar in Soviet Political Theory (3s-0; 3s-0)
615. Empirical Political Theory (3s-0; 0-0)or(0-0; 3s-0)
***616. Normative Political Theory** (3s-0; 0-0)or(0-0; 3s-0)
621. Government of Canada (3s-0; 3s-0)
641. Research in Soviet Government (3s-0; 3s-0)

651. Public Administration (3s-0; 3s-0)
660. Theories of International Politics (3s-0; 3s-0)
661. International Politics (3s-0; 3s-0)
663. Problems of International Organization: Political and Security (3s-0; 3s-0)
665. Problems of International Organization: Economics and Social (3s-0; 3s-0)
675. Government and Politics in India and Pakistan (3s-0; 3s-0)
680. Western European Democracies (3s-0; 3s-0)
690. Political Behavior (3s-0; 3s-0)

PSYCHOLOGY

1. The Department offers graduate work leading to the M.A., M.Sc., and Ph.D. degrees.
2. Requirements for the Master's degree include the demonstration of competence in:
   (a) *Core Courses*—
      (1) Psychology 502, History and Systems of Psychology
      (2) Psychology 530, Research Design I
      (3) Psychology 531, Research Design II
      (4) Psychology 560, Advanced Experimental Psychology
      (5) Psychology 583, Personality-Social
   (b) *One of the Following Areas of Specialization*—clinical, comparative and physiological, general experimental, industrial, learning, methodology, personality, psychometrics, psychopathology, sensation and perception, social, theoretical.
3. Requirements for the Ph.D. include the demonstration of competence in:
   (a) *Master's Level Core Courses Listed Above.*
   (b) *One of the Following Areas of Specialization*—
      (1) theoretical-experimental
      (2) quantitative-psychometrics
      (3) personal-psychopathology
      (4) clinical research
      (5) social psychology

   The intensity of depth as opposed to the extent of breadth within a given option can vary somewhat in accordance with research interests and an individual program as determined in consultation with the Department.
4. The instructional and research facilities include laboratories for human and animal experimentation, a departmental equipment room and shop, a departmental clinic, cubicles for individual psychological testing, interviewing and counselling, and practicum arrangements with local hospitals and industry. In addition, the department receives technical assistance from the university computing centre and the electronic instrumentation shop.
5. Several half-time graduate assistantships, involving teaching or research or both, are available to outstanding applicants. The stipends vary from $1,800 to $3,000 plus fees and a travel grant up to $250. Initial inquiries con-

cerning these and other Graduate Awards should be addressed to the Dean of the Faculty of Graduate Studies. Completed applications should be forwarded to the Chairman, Graduate Students Selection Committee, Department of Psychology.

6. In addition to the above, summer research assistantships to the value of $1,000 are available in most currently active staff research projects.

7. *Graduate Courses*

501. Honors Seminar	(3-0; 3-0)
502. History and Systems of Psychology	(3-0; 3-0)
504. Conference Course in Psychology	(Arranged)
520. Seminar in Industrial Psychology	(3s-0; 3s-0)
528. Advanced Psychometric Theory	(3-1; 3-1)
530. and 531. Research Design I and II	(3-1; 3-1)
535. Clinical Assessment I	(3-3; 3-3)
536. Clinical Assessment II	(3-3; 3-3)
538. Clinical Assessment III	(3-3; 3-3)
540. Seminar in Social Psychology	(3s-0; 3s-0)
550. Experimental Analysis of Personality	(3-0; 0-0) or (0-0; 3-0)
560. Advanced Experimental Psychology	(3-3; 3-3)
565. Seminar in Learning Theory	(3-0; 0-0)
570. Drugs and Behavior	(3-0; 0-0) or (0-0; 3-0)
574. Seminar in Philosophy and Psychology	(2s-0; 2s-0)
575. Advanced Physiological Psychology	(3-3; 3-3)
577. Seminar in Physiological Psychology	(3s-0; 0-0) or (0-0; 3s-0)
578. Experimental Psychopathology	(3-0; 0-0) or (0-0; 3-0)
583. Personality-Social	(3-0; 3-0)
584. Seminar in Personality Theory	(3s-0; 3s-0)
585. Seminar in Theories of Perception	
586. Normality, Neurosis, Sociopathy	(3-0; 3-0)
588. The Psychoses	(3-0; 3-0)
590. Systems in Psychotherapy	(3-3; 3-3)
592. Psychological Therapies	(3-3; 3-3)
599. Honors Thesis	(3-3; 3-3)
600. Research Seminar	(2s-0; 2s-0)
648. Research	(3-3; 0-0)
649. Research	(0-0; 3-3)
698. Advanced Research	(3-3; 0-0)
699. Advanced Research	(0-0; 3-3)

RADIOLOGY

Facilities exist within the Department of Radiology, University Hospital and University of Alberta for students who wish to proceed to the M.Sc. degree in any of the following fields:

1. Clinical Radiation Biology
2. Radiologic Physics
3. Health Physics

Program in Radiation Physics may be arranged in co-operation with the Physics Department, University of Alberta and the Department of Radiology.

Inquiries should be directed to the Head of the Department of Radiology, University Hospital, Edmonton.

ROMANCE LANGUAGES

1. Graduate work leading to the M.A. or Ph.D. may be undertaken in many areas of Romance languages and literatures, or of comparative literature.
2. Prospective candidates should direct their enquiries about programs to the Head of the Department.
3. Assistantships are available in French and Spanish.
4. *Graduate courses*

French—

Composition and Language:

500. Special Reading Course (3-0; 3-0)

510. Seminar in French Composition (3-0; 3-0)

601. History of the French Language (3-0; 3-0)

Mediaeval Literature:

600. Seminar in Mediaeval French Literature (3-0; 3-0)

Renaissance Literature:

610. Seminar in French Renaissance Literature (3-0; 3-0)

Special Subjects:

612. The Spirit of Humanism in France and England at the Beginning of the Renaissance (3-0; 3-0)

614. Rabelais (3-0; 3-0)

616. Ronsard (3-0; 3-0)

618. Montaigne (3-0; 3-0)

The Seventeenth Century:

619. Seminar in Seventeenth-Century Literature (3-0; 3-0)

Special Subjects:

620. The French Moralists (3-0; 3-0)

625. Molière (3-0; 3-0)

The Eighteenth Century:

629. Seminar in Eighteenth-Century Literature (3-0; 3-0)

Special Subjects:

630. The Eighteenth-Century Novel (3-0; 3-0)
634. Marivaux (3-0; 3-0)
636. Voltaire (3-0; 3-0)
638. Rousseau (3-0; 3-0)

The Nineteenth Century:

640. Seminar in Nineteenth-Century Literature (3-0; 3-0)

Special Subjects:

645. Stendhal (3-0; 3-0)
648. Literature and the Plastic Arts from the time of Delacroix and Baudelaire (3-0; 3-0)
651. The Naturalistic Novel (3-0; 3-0)
655. The Late Nineteenth-Century Theatre (3-0; 3-0)

The Twentieth Century:

660. Seminar in Twentieth-Century Literature (3-0; 3-0)

Special Subjects:

665. Valéry (3-0; 3-0)
670. Proust (3-0; 3-0)
699. Conference Course (3-0; 3-0)

Spanish—

Language:

530. Spanish American Dialectology (3-0; 3-0)
540. History of the Spanish Language (3-0; 3-0)

Mediaeval Literature:

550. Mediaeval Narrative Poetry (3-0; 3-0)
560. Mediaeval Spanish Prose (3-0; 3-0)
565. Mediaeval Lyric Poetry (3-0; 3-0)

The Golden Age:

600. The Literature of the Discovery, Conquest and Colonization of America (3-0; 3-0)
610. The Sentimental Romances and the Books of Chivalry. The Pastoral and Moresque Novel (3-0; 3-0)
612 The Picaresque Novel (3-0; 3-0)
615. Cervantes (3-0; 3-0)
620. Sixteenth Century Drama (3-0; 3-0)
624. Lope de Vega (3-0; 3-0)
626. Tirso de Molina and Juan Ruiz de Alarcon (3-0; 3-0)
627. Calderón (3-0; 3-0)
630. The Romancero (3-0; 3-0)
633. The Poetry of the Baroque Period (3-0; 3-0)

635. Góngora (3-0; 3-0)
640. Quevedo and Gracián (3-0; 3-0)

The Eighteenth and Nineteenth Centuries:

650. The Novel, Poetry and Drama of the Eighteenth Century (3-0; 3-0)
660. The Romantic Movement (3-0; 3-0)
665. Galdos and his Contemporaries (3-0; 3-0)

The Twentieth Century:

670. Contemporary Spanish and Spanish American Poetry (3-0; 3-0)
671. Contemporary Spanish and Spanish American Novelists (3-0; 3-0)
675. Unamuno (3-0; 3-0)
699. Conference Course (3-0; 3-0)

Romance Linguistics:

500. Phonology: Synchronic and Diachronic (3-0; 3-0)
505. Comparative Romance Linguistics (3-0; 3-0)

SECONDARY EDUCATION

1. The Department of Secondary Education offers programs leading to the M.Ed., Ph.D. and Ed.D. degrees.
2. The work of this Department is closely coordinated with that of other Departments in the Faculty of Education and with other faculties and schools of the University.
3. Graduate programs in Secondary Education normally include both professional courses in education and senior or graduate courses offered by other faculties and schools in the University. Advanced Curriculum and Instruction courses in most of the traditional fields of study are offered by the Department of Secondary Education.
4. Before a student can be admitted as a candidate for the M.Ed. or higher degree, his record must be acceptable to the Faculty of Graduate Studies and to the Department. The prospective candidate should first consult the Head of the Department of Secondary Education who, together with other members of the staff, will plan an appropriate program.
5. Full-time attendance for a minimum period of one academic year at the University is required for the M.Ed. degree in Secondary Education.
6. A number of assistantships are available to well qualified candidates for the M.Ed. or Ph.D. in Secondary Education.
7. Undergraduate courses which may be taken for graduate credit.

Ed. CI 456. Advanced Curriculum and Instruction in Secondary School English (3-0; 3-0)

Ed. CI 460. Advanced Curriculum and Instruction In Secondary School Foreign Languages (3-0; 3-0)

Ed. CI 462. Audiovisual Communication in Teaching and Learning (3L; 3L)

Ed. CI 468. Advanced Curriculum and Instruction in Secondary School Social Sciences (3-0; 3-0)

Ed. CI 472. Advanced Curriculum and Instruction in Secondary School Mathematics (3-0; 3-0)

Ed. CI 476. Advanced Curriculum and Instruction in Secondary School Biological Sciences (3L; 3L)

Ed. CI 480. Advanced Curriculum and Instruction in Secondary School Physical Sciences (3L; 3L)

Ed. CI 484. Advanced Curriculum and Instruction in Secondary School Business Education (3-0; 3-0)

Ed. CI 496. Advanced Curriculum and Instruction in the Fine Arts—Music, Art or Drama (6L; 6L)

8. *Graduate Courses*

Ed. CI 550. Secondary Education Seminar

Ed. CI 580. Curriculum Development (3-0; 3-0)

Ed. CI 680. Secondary Education To a maximum of 6 hours
Reading and discussion of research, curriculum, and teaching procedures in any one of the major fields of the secondary school.

SLAVONIC LANGUAGES AND LITERATURES

1. The Department offers programs of course work and research leading to the degree of M.A. in Russian, in Slavonic languages and literatures (Russian, Ukrainian, Polish, Serbo-Croatian, Church Slavonic), in Slavonic linguistics and in Slavonic and Soviet Studies, with Russian language and literature serving as the core.
2. A modern Language Laboratory and large collections of slides, records and other audio-visual aids offer supplementary facilities for an intensive training in Slavonic languages.
3. A rapidly expanding collection of books, periodicals, documents and microfilms in the Cameron Research Library offers adequate facilities for our M.A. programs. Of special interest is our R. R. Gonsett Collection.
4. Information regarding assistantships and other forms of financial assistance currently available to students registered in programs for the M.A. degree in the department will be supplied upon request; address inquiries to the head of the department.
5. *Graduate Courses*

Russian—

550. The Russian Psychological Novel (3-0; 3-0)

570. Soviet Russian Literature (3-0; 3-0)

610. Russian Mediaeval Literature (0-0; 3-0)

640. Russian Poetry of the Eighteenth and Nineteenth Centuries (3-0; 3-0)

699. Conference Course
This is an honors or graduate course to meet the needs of individual

students. It will consist of a detailed study of some great author or literary problem, directed reading and discussion.

Ukrainian—

610. Old Ukrainian Literature (0-0; 3-0)

***630. Seminar on Soviet Ukrainian Novelists** (3s-0; 3s-0)
The course will consist of a detailed treatment of several representative Soviet Ukrainian novels. Students will be required to submit papers on approved topics to be discussed in class.

640. T. H. Shevchenko (3-0; 3-0)
A study of the life and works of T. H. Shevchenko.

650. I. Franko (3-0; 0-0)
A study of the life and works of I. Franko.

660. L. Ukrainka (0-0; 3-0)
A study of the life and works of L. Ukrainka.

699. Conference Course
This is an honors or graduate course to meet the needs of individual students. It will consist of a detailed study of some great author or literary problem, directed reading and discussion.

Slavonics—

520. Old Church Slavonic (3-0; 3-0)

540. Introduction to Comparative Slavonic Philology (3-0; 3-0)

550. Seminar in Slavonic Linguistics (3s-0; 3s-0)

580. Slavonic and Soviet Studies: an interdisciplinary Seminar (3s-0; 3s-0)

600. Early Literature of the Kievan Period (3-0; 0-0)

620. Comparative Slavonic Literature (3-0; 3-0)

650. Departmental Seminar on Modern Slavonic Philology and Linguistics (1s-0; 1s-0)

670. Research Seminar (3-0; 3-0)
The study of research methods.

680. Slavonic Civilization (3-0; 3-0)

SOCIOLOGY AND ANTHROPOLOGY

The Department offers graduate work leading to the M.A. and Ph.D. degrees in Sociology, and the M.A. degree in Anthropology.

1. A number of part time graduate assistantships, involving teaching or research, are available to outstanding applicants. In addition, graduate students may compete for the general graduate scholarships listed elsewhere.
2. Stipends vary from $1,800 to $3,000, plus fees, plus a travel grant allowance. Graduate students may compete for the general graduate scholarships listed elsewhere. Initial inquiries concerning financial assistance should be addressed to the Dean of the Faculty of Graduate Studies. Completed applications should be forwarded to the Head, Department of Sociology and Anthropology.

ANTHROPOLOGY

1. Requirements for the Master's degree include:
   (a) a minimum of 11 courses in undergraduate and graduate anthropology, and
   (b) the demonstration of competence in the following areas, as determined by a comprehensive examination.
      (1) History and Theory of Anthropology.
      (2) Topical Ethnology: one of the following—
      Kinship, Primitive Economics, Political Organization, Law, Religion, Social Structure.
      (3) Regional Ethnology and Archaeology: one of—
      Asia, Africa, North America, Middle America, South America, Oceania.
   (c) an acceptable Master's thesis.
   (d) demonstration of reading knowledge of a modern language other than English.

2. *Graduate Courses*

Anthropology—

500. Proseminar in Anthropology (3-0; 3-0)

502. Conference Course in Anthropology (3-3; 3-3)

503. Seminar in Cross-Cultural Research (3s-0; 3s-0)

504. Methods in Ethnology and Social Anthropology (3-3; 3-3)

510. Theory of Culture (3-0; 3-0)

590. Advanced Physical Anthropology (3-3; 3-3)
Prerequisite: Anthropology 390 or consent of department.

595. Seminar in Archaeology (3-3; 3-3)

596. Field Methods in Archaeology (3s-3; 3s-3)

SOCIOLOGY

1. Requirements for the Master's degree include:
   (a) a minimum of 11 courses in undergraduate and graduate sociology, and
   (b) the demonstration of competence in the following areas, as determined by a comprehensive examination.
      (1) Core Areas
         (a) Methodology. Sociology 310 and 410 are relevant
         (b) Theory. Sociology 430 and 530 are relevant
         (c) Social Psychology
         (d) Social Organization
      (2) One of the following areas of further specialization:
      Theory, Methodology, Deviance and Social Control, Sociology of Symbolic Forms, Ecology, Demography, Social Psychology or Social Organization with one of the following emphases: Theory of Organization or Social Psychology, The Family, Industrial Sociology, Political Sociology, Rural-Urban Sociology, Minority Group Relations, Medical Sociology, Modernization.
   (c) An acceptable Master's thesis.

2. Requirements for the Ph.D. include the demonstration of competence in:
   (a) Areas listed under 1.(b)(1) above. A broader and deeper grasp of these areas is expected of Ph.D. candidates.
   (b) Two of the areas of specialization listed under 1(b) (2) above.
   (c) Reading knowledge of a language other than English (French, German, Russian, or Spanish).
   (d) An acceptable doctoral thesis.
3. In addition to the graduate courses listed below, senior courses in Sociology and in related fields may be included in the graduate program upon recommendation of the Department of Sociology and Anthropology.
4. *Graduate Courses*

Sociology—

502. Conference Course	(3-0; 3-0)
505. Seminar in Sociology of Modernization	(3s-0; 3s-0)
510. Research Seminar	(3s-0; 3s-0)
519. Selected Topics in Research Methodology	(3s-0; 3s-0)
520. Seminar in Deviance and Social Control	(3s-0; 3s-0)
526. Seminar in Criminological Theory	(3s-0; 0-0)or(0-0; 3s-0)
527. Seminar in Correctional Theory	(3s-0; 0-0)or(0-0; 3s-0)
536. Seminar in Sociology of Knowledge	(3s-0; 3s-0)
540. Seminar in Social Psychology	(3s-0; 3s-0)
542. Small Group Behavior	(3s-0; 3s-0)
550. Seminar in the Human Community	(3s-0; 3s-0)
555. Seminar in Demography	(3s-0; 0-0)or(0-0; 3s-0)
560. Seminar in Social Organization	(3s-0; 3s-0)
562. Seminar in Social Class	(3s-0; 0-0)or(0-0; 3s-0)
570. Seminar in the Family	(3s-0; 0-0)or(0-0; 3s-0)
590. Seminar in Industrial Sociology	(3s-0; 0-0)or(0-0; 3s-0)
594. Seminar in Medical Sociology	(3s-0; 0-0)or(0-0; 3s-0)
602. Conference Course	(3s-0; 3s-0)
610. Advanced Seminar in Sociological Analysis	(3s-0; 3s-0)
619. Advanced Research	(3s-0; 3s-0)
630. Advanced Seminar in Theory	(3s-0; 3s-0)
640. Advanced Seminar in Social Psychology	(3s-0; 3s-0)
642. Experimental Small Group Research	(3s-3; 3s-3)

SOIL SCIENCE

1. The Department of Soil Science has special research laboratories and facilities in the Agriculture Building and adjacent greenhouses and at the Ellerslie Farm for each of the fields of interest listed below. A full line of modern research equiment is available.

   The Alberta Soil Survey occupies quarters in the same building and

graduate students have an opportunity to broaden their knowledge by association with the Soil Survey staff.

The Department has plots on Black soil at Ellerslie and on Grey Wooded soil at Breton for field tests, and carries on co-operative fertilizer experiments with farmers over a wide area. A complete line of field equipment is available for plot work with cereal and forage crops.

2. Special fields of interest: soil genesis and classification; soil physics; soil chemistry; soil colloids; soil organic matter; soil microbiology; soil fertility; soil testing. Receiving special attention at present are the following:
   (a) Problems in pedogenesis: mineral and organic composition, weathering, leaching, clay characteristics, cation exchange.
   (b) Soil temperature and soil moisture studies.
   (c) Chemical studies of Solonetzic (hardpan) soils and saline soils.
   (d) Soil fertility and plant nutrition problems: fertilizer and rotation studies, soil deterioration under cultivation, phosphorus and potassium availability, and alfalfa-stand problems.
   (e) Soil nitrogen transformations, including fixation, mineralization and immobilization, and dentrification.
   (f) Soil testing; correlation of soil test values with response to fertilizer.

3. Graduate students who have the necessary training may take work leading to the degree of M.Sc. in Soil Science. Exceptionally well qualified graduates may be considered further as candidates for the Ph.D. degree.

   Grants, bursaries, and assistantships are available for research from the National Research Council, the Province of Alberta, and industries interested in crop production and the use of fertilizers. Prospective students are invited to direct their inquiries about opportunities for research in specific fields and possibilities of financial assistance to the head of the Department of Soil Science.

4. Selected courses from other Departments and Faculties are recommended according to the field of specialization. Examples of the latter are Biochemistry 300, 511, 531; Botany 320; Chemistry 312, 370, 450, 511, 572; Geology 306, 351, 454, 465, 466; Mathematics 304, 306; Microbiology 360; Pharmacy 501, 502; Physics 340, and 440.

5. Undergraduate courses which may be taken for graduate credit.

420. Soil Classification	(3-3; 0-0)
430. Soil Microbiology	(0-0; 3-3)
450. Soil Colloids	(3-3; 0-0)
460. Soil Fertility	(0-0; 3-3)
470. Irrigation and Drainage	(3-3; 0-0)
480. Soil Conservation	(0-0; 3-0)

6. *Graduate Courses*

501. Special Topics and Problems	Max. of 6 hrs. credit
520. Pedology—S. Pawluk	(0-0; 3-3)

521. Chemical Methods as Applied to Soil Research (3-3; 0-0)
G. R. Webster

530. Advanced Soil Microbiology—F. D. Cook (3-3; 0-0)

531. Physical Methods as Applied to Soil Research (0-0; 3-3)
J. A. Toogood

631. Seminar—Staff

SURGERY

1. Research facilities are available in the Surgical-Medical Research Institute for graduate students who wish to register for the degree of M.Sc. in Experimental Surgery. This laboratory is well equipped for all types of experimental work on animals of all sizes. Specal facilities are available for projects in the fields of experimental cardio-vascular, gastrointestinal, renal and endocrine physiopathology. An adequately equipped isotope laboratory and a biochemical laboratory with technical staff are available in any of the clinical fields to asssit the graduate students who wish to carry out a research project in this laboratory.
2. *Graduate Courses*

500. Experimental Surgery (0-0; 0-3)

Inquiries should be directed to the Head of the Department of Surgery, University Hospital.

ZOOLOGY

1. The Department of Zoology has facilities to train students for the M.Sc. and Ph.D. degrees. Particular emphasis is laid upon ecology, physiology, invertebrate zoology, parasitology and animal behavior. A reference collection of the invertebrate and vertebrate fauna of Alberta is housed in the department. An electron microscope and histological, radio-biological and controlled aquatic environment apparatus are available, as well as general laboratory and collecting equipment. The Alberta Biological station serves as headquarters for summer field work.
2. A number of Assistantships for graduate students are available. Funds are also available for the support of researches undertaken during the summer.
3. All inquiries concerning registration and financial assistance should be directed to the Head of the Department of Zoology. Registration as a graduate student in Zoology is done in consultation with members of the department. Attention is directed to the General Regulations of the Faculty of Graduate Studies.
4. Undergraduate courses which may be taken for graduate credit.

Zoology—

404. Ichthyology and Herpetology (3-3; 0-0)

406. Ornithology (0-0; 3-3)

408. Mammalogy (3-3; 0-0)

411. Embryology (3-3; 0-0)

412. Experimental Embryology (0-0; 3-3)

421. Mechanisms of Evolution (0-0; 3-0)
(Not offered in 1966-67)

440. Comparative Animal Physiology (3-3; 3-3)

451. Aquatic Invertebrates of Alberta (0-0; 3-3)

452. Principles of Parasitism (0-0; 3-3)

462. Animal Ecology (3-3; 0-0)

464. Limnology (3-3; 0-0)

465. Boreal Ecology (0-0; 3-3)

471. Animal Behavior (3-0; 0-0)

481. Practical Histology (0-0; 3-3)

5. *Graduate Courses*

515. Introduction to Mathematical Biology (3-0; 3-0)
(Not offered in 1966-67)

516. Mathematical Models of Animal Social Behavior (2-0; 2-0)
(Not offered in 1966-67)

520. Seminar in Zoology—D. M. Ross (1-0; 1-0)

525. Field Course in Zoology—Staff

529. Special Problems in Zoology—Staff (3 hrs. either or both terms)

540. Environmental Physiology—C. P. Hickman (1-5; 1-5)
(Not offered in 1966-67)

541. Seminar in Environmental Physiology—C. P. Hickman (2-0; 0-0)

542. Seminar in Comparative Animal Physiology—D. D. Beatty (2-0; 2-0)
(Not offered in 1966-67)

555. Wildlife Parasitology—J. C. Holmes (0-0; 3-3)

556. Helminthology—J. C. Holmes (1-5; 1-5)
(Not offered in 1966-67)

562. Conservation Topics (1-0; 1-0)

563. Population Ecology—D. A. Boag (0-0; 1-5)

565. Principles of Conservation and Wildlife Management
W. A. Fuller and V. Lewin
(Not offered in 1966-67)

571. Animal Behavior (0-0; 3-0)
(Not offered in 1966-67)

582. Advanced Histology—G. O. Mackie (0-0; 3-3)
(Not offered in 1966-67)

620. Selected Topics of Modern Biology—Seminar (0-0; 3-0)

Paleontology—

518. Palentology of the Lower Vertebrates (3-3; 0-0)

519. Paleontology of the Higher Vertebrates (0-0; 3-3)

620. Problems in Vertebrate Paleontology—R. C. Fox (1-0; 1-0)

XXIII

Awards and Financial Assistance

GENERAL INFORMATION

This Calendar includes a complete list of awards of all kinds and of financial assistance available to students at the University of Alberta, Edmonton, as shown in the Table of Contents. Students attending at the University of Calgary must refer to the Calgary Calendars.

Students of high ability or those who require financial assistance are urged to read carefully the sections of interest to them.

Application forms may be had from the Student Awards Office, Edmonton. Unless otherwise stated completed applications must be received by the Student Awards Office, Edmonton, by dates as follows:

Matriculants	— August 1
Undergraduates	— June 15
Graduates	— March 1

Where no application information is shown, the award is made automatically without applications.

Publication of Awards is as follows:

Graduating or Graduate Students	— Spring Convocations
Undergraduate (automatic awards)	— Mid-June
Undergraduate (awards applied for)	— First week of July
Matriculant (and Undergraduate of Aug. 1 date)	— First week of Sept.

In order that awards may be equitably distributed, no student may hold more than one major award in any one year. All monetary awards except certain cash prizes are contingent upon the student proceeding with his university course and are payable only when the student is in actual attendance at the University. Payment of fees is a first charge against such awards.

The University assumes liability for the payment of fellowships, scholarships, bursaries, prizes and other awards only to the extent that gifts from donors, or returns from particular investments for these purposes, will permit.

For further information inquiry should be made to:—

Mr. R. B. Wishart,
Administrator of Student Awards,
Student Awards Office,
University of Alberta,
Edmonton, Alberta.

For information regarding assistance under the Provincial Students Assistance Act or the Canada Student Loans Plan refer to the special sections in this calendar or inquire of Student Awards Office, Edmonton.

As this calendar is published a considerable time before the opening of the Session, the University reserves the right to make whatever changes circumstances may require, including cancellation of particular awards.

MATRICULATION AWARDS

Note: Unless otherwise stated in the terms of any award, these awards are tenable at the University of Alberta, Edmonton. There are a few which are also tenable at a Junior College affiliated with the University. If so, this is stated in the terms. Students attending at the University of Calgary must refer to the Calgary Calendars.

Awards by the University of Alberta and the Province of Alberta are listed first. The remainder are listed alphabetically.

University of Alberta Honor Prizes—The Board of Governors of the University offers annually a prize to the value of $50.00 to each student from Alberta high schools entering a degree or diploma program in the University with an average standing in the required examinations of matriculation of at least 85%.

The University of Alberta Matriculation Scholarships of the value of three year's fees are offered annually by the University to two matriculating students from Alberta High Schools, (other than those eligible for a Tegler or a Bennett matriculation scholarship) for outstanding merit in the required matriculation subjects. This must be at least 80% and grades X to XII inclusive must have been completed in not more than four years. Second class standing must be achieved for continuation of the award.

Apply to Administrator of Student Awards by August 1.

University of Alberta War Memorial Scholarships—The War Memorial Fund of the University of Alberta will provide a number of awards of up to $650.00 for study in a degree or diploma program at the University of Alberta on the basis of scholastic ability and financial need and according to the following priorities: (1) to a son or daughter of a member of the armed forces or merchant navy who lost his or her life during, or as a direct result of, hostilities in the War of 1939-45; or (2) to the son or daughter of a member of the said forces or merchant marine who was seriously incapacitated either physically or mentally; or (3) to the son or daughter of any man or woman who served in any of His Majesty's or Allied forces during 1939-45. Failing the receipt of applications from the above-mentioned groups, consideration will be given to applications from (4) sons or daughters of native or naturalized Canadians domiciled in Alberta.

These awards are open to matriculants or undergraduates.

Matriculants apply to Administrator of Student Awards by August 1. Undergraduates apply to Administrator of Student Awards by June 15.

Province of Alberta Matriculation Scholarships (The Queen Elizabeth Education Scholarship Fund)—The Province of Alberta, under the Students Assistance Act, provides scholarships to students who are bona fide residents of Alberta on a basis of academic achievement in the required subjects of senior matriculation provided that this shall be 75% or better. The scholarships are

tenable in the first year at the University of Alberta, the University of Calgary or in a program of university level at a Junior College affiliated with either University, or at another aproved college or university when the program being taken is of university level and is not available at the University of Alberta.

The basic amount of the scholarship is $100, but this may be increased according to the financial need of the student, to a maximum which may in some cases be as high as $1,250. Application may be made for the basic $100 without evidence of financial need. If the application is for more than $100, the form must be filled in completely in order to indicate the amount of financial need.

Apply on the Provincial Government form to Secretary, Students Assistance Board, Provincial Department of Education, Edmonton.

The Alberta Hotel Association Scholarships. Sixty-eight scholarships of $250 or $500 are offered to matriculants from Alberta High Schools entering the University of Alberta, the University of Calgary, or a program of university level at a Junior College affiliated with either University or at another university if the program is not available in Alberta. The scholarships of $250 are intended for students who can secure their desired program in their home city and those of $500 for students who must live away from home. The basis of award is academic standing in Grade XII and financial need.

Application forms may be secured from the Alberta Hotel Association, Credit Foncier Building, 10275 Jasper Avenue, Edmonton, and must be completed and returned by July 15.

The Alberta Institute of Agrologists Scholarship in First-Year Agriculture, valued at $250.00, will be awarded annually to an applicant from either an Alberta high school or a provincial School of Agriculture on the basis of scholastic standing. This award is also tenable at a Junior College affiliated with the University, providing the program is offered.

Apply to the Administrator of Student Awards by August 1.

The Alberta Motor Transport Association Bursaries—A number of bursaries will be provided annually to matriculants from Alberta High Schools to enter any degree or diploma program at the University of Alberta, the University of Calgary, or a program of University level at a Junior College affiliated with either University.

The basis of award will be academic standing and financial need. A reasonable geographical distribution within the Province will be made.

Apply to the Administrator of Student Awards by August 1.

The Alberta Wheat Pool Bursaries for Rural Students of $500 per year each are offered to two students from Alberta High Schools, one whose home is in the southern half of the Province (inclusive and south of township 44) and one from the northern half. These awards are open to students whose parents are actively engaged in farming. Preference will be given to applicants entering the Faculty of Agriculture but others will be considered including those entering a Junior College affiliated with the University. The scholarships are renewable up to a maximum of five undergraduate years provided an average

of not less than 65% is maintained. The basis of award will be matriculation standing and financial need.

Apply to Administrator of Student Awards by August 1.

The Alberta Wheat Pool Scholarships of the value of $200.00 each are offered annually to three students of outstanding merit entering the first, second and third years of Household Economics at the University of Alberta. These scholarships are available to students who have been members of 4H Homemaking Clubs.

Applications must be submitted to the Supervisor of 4H Clubs, Provincial Department of Agriculture, Edmonton, by August 1.

The Association of Professional Engineers of Alberta Matriculation Awards. The Association will provide six awards of the value of tuition and fees for the first year to six students on the following basis. The awards will be given to the student with the highest average standing on Mathematics 30, Mathematics 31, Chemistry 30 and Physics 30 in each of Edmonton and Calgary and the general areas of Lethbridge, Medicine Hat, Red Deer and Peace River provided such students enter Engineering, Geology or Geophysics at the University of Alberta.

Selection will be made by the Association. Application is not necessary.

The Viscount Bennett Scholarships—The late Right Honorable Viscount Bennett, P.C., K.C., LL.D., D.C.L., of Calgary and Mickelham, founded a trust to support scholarships open to students who have resided for at least five consecutive years in Calgary, or within twenty miles of that city, or in Banff National Park.

Three scholarships of $350.00 each are available for competitive award on the basis of academic attainment, good character and satisfactory personal qualities.

Apply to the Administrator of Student Awards by August 1.

The Beta Sigma Phi Matriculation Bursary of $500 will be offered annually to a student entering first year University of Alberta, Edmonton and whose home is in that part of Alberta north of Red Deer. The basis of award will be high academic standing in the required Grade XII subjects and evidence of financial need.

Apply to the Administrator of Student Awards by August 1.

The Calgary and District Retail Druggists' Association Scholarship of the value of $250.00 is offered to a student of outstanding merit entering first year Pharmacy. The award will be based on the standing in the required subjects of grade XII. The student must have carried out the work of grade XII in that part of Alberta south of a line from Rocky Mountain House to Red Deer to Coronation, but not including those centres.

Apply to the Administrator of Student Awards by August 1.

The Canadian Bechtel Limited Bursary in Engineering of $600.00 is awarded annually on the basis of financial need and of matriculation standing to a matriculant from an Alberta high school entering the first year of Engineering at the University of Alberta.

Apply to the Administrator of Student Awards by August 1.

Canadian Fina Oil Scholarships. A number of scholarships ranging from $450 to $1,000 will be awarded.

The plan covers Company employees and children or wards of such to enter any undergraduate program at any recognized university. These awards are renewable to a maximum of four years providing satisfactory academic standing is maintained. Full details are available from the Company and completed application forms should be returned to Canadian Fina Oil Scholarship Committee, 736 - 8 Ave. S.W., Calgary, Alberta, by July 1.

The donor will, in addition, provide a grant-in-aid of $250 to the University for each scholarship holder.

The Canadian Foundation for Poliomyelitis and Rehabilitation (Alberta Chapter) Bursaries of $350.00 are offered to students in the Diploma program in Rehabilitation Medicine. The Foundation is sponsored by the Royal Canadian Legion. Three bursaries will be awarded each year, preferably one at each of the levels of entering first, second and third years. The basis of award will be academic standing and financial need. It is expected that recipients will carry on their profession in Alberta for a reasonable period after graduation.

Apply to the Administrator of Student Awards by August 1.

Canadian Mathematical Congress Scholarships in Mathematics.

The Friends of the Canadian Mathematical Congress Scholarships, one of the value of $500.00 and one of the value of $350.00.

The Nickle Foundation Scholarship in Mathematics of the value of $400.00.

These scholarships will be awarded to students who have taken all of their Grade XII work at an Alberta high school, have obtained satisfactory standing in this work (including Mathematics 30 and 31), and are entering the first year of a degree program at a University. The awards will be made primarily on the basis of special competitive examination in mathematics to be set and marked by the Department of Mathematics and to be written early in May.

The first Scholarship of the Friends of the Canadian Mathematical Congress is to be paid to the over-all winner in this competition.

These scholarships may be taken in any degree program. The Nickle Foundation Scholarship in Mathematics is tenable only at the University of Alberta or the University of Calgary. The others are tenable at the University of Alberta or any other Canadian University.

Candidates should apply direct to their High School Principal by March 15. Principals will forward the names to the Department of Mathematics, University of Alberta, Edmonton, by March 31.

The Canadian Superior Oil Ltd. Bursary is offered to a male Canadian citizen entering the first year of a program in Chemistry, Geology, or Engineering at the University of Alberta. The bursary will cover tuition fees and books for a four year period and may also include a subsistance allowance if deemed necessary, the total not to exceed $700 per year.

The award will be made on a basis of grade XII standing and financial need. A change in program from any of the above three, or failure to maintain a satisfactory academic standing will entail forfeiture of the bursary.

Apply to the Administrator of Student Awards by August 1.

The Cardston Pharmacy Scholarship of the value of $100.00 is offered annually to a student of outstanding merit entering first year Pharmacy.

Apply to the Administrator of Student Awards by August 1.

The City of Calgary Matriculation Scholarships. Seven scholarships of $500.00 each are offered annually by the City of Calgary to Calgary matriculation students entering first year university in any faculty. The awards will be made on the basis of proficiency and financial need. The students will be given free choice in selection of university to be attended.

Written application setting forth the financial ability of the home and other pertinent information should be received by the City Clerk, Calgary, by August 1 on the forms available at the Office of the City Commissioner, Calgary.

The City of Edmonton Matriculation Scholarships. Two scholarships of the value of $300.00 each are offered annually by the City of Edmonton to matriculating students entering first year at the University of Alberta at Edmonton. One of these will be restricted to a student who has attended an Edmonton School from Grade X to Grade XII. The basis of award will be academic standing and financial need.

Apply to Administrator of Student Awards by August 1.

The Civil Service of Alberta Bursaries—A number of bursaries of a maximum of $600.00 are offered annually to first year University students from Alberta high schools. These students must be the children of provincial civil servants, retired provincial civil servants or deceased provincial civil servants. The amount of $600.00 will be paid to each recipient who finds it necessary to live away from home while $300 will be paid to each recipient who can attend the chosen course while living at home. These bursaries are tenable at the University of Alberta, the University of Calgary or in a program of university level at a Junior College affiliated with either University. They are also tenable at the Institutes of Technology, Calgary and Edmonton.

Application forms may be obtained from the Executive Secretary, Civil Service Association of Alberta, Terrace Building, Edmonton, and should be completed and returned to him not later than July 31.

The Percy Clubine Memorial Scholarships of $500 each will be awarded annually to two students who are entering first year of the Faculty of Agriculture of the University of Alberta, conditional on a minimum Grade XII average of 70%.

Apply to Administrator of Student Awards by August 1.

The Crown Zellerbach Canada Limited Matriculation Scholarship of $1,500 is offered annually to a Canadian student of outstanding academic merit who is entering the Faculty of Education, University of Alberta. The amount will be payable at $400.00 in each of the first and second years and $350.00 in each of the third and fourth years. In order to continue to be eligible, the student must take the four years of the program consecutively and achieve an average of at least 65% each year.

Apply to the Administrator of Student Awards by August 1.

Edmonton Civic Employees Bursaries. A number of bursaries of $450.00 each are offered annually to matriculants entering the University of Alberta or to holders of High School Diplomas entering The Institutes of Technology, Calgary and Edmonton. The basis of award will be academic standing in Grade XII and financial need.

Applicants must be children of City of Edmonton Civic employees, deceased civic employees or retired civic employees.

Application forms may be obtained from The Executive Secretary, Edmonton Civic Employees' Welfare Chest Fund, Finance Department, City Hall, Edmonton and should be completed and returned to him by July 31.

The Edmonton and District Druggists' Association Scholarship, of the value of $100.00, is offered annually to a student of outstanding merit entering first-year Pharmacy. The award will be based on the standing in the required subjects of Grade XII. The student must have carried out the work of

The Edmonton Society of Pharmacists Scholarship, of the value of $100.00, is offered annually to a student of outstanding merit entering first-year Pharmacy. The award will be based on the standing in the required subjects of Grade XII. The student must have carried out the work of Grade XII in that part of Alberta north of a line from Rocky Mountain House to Red Deer to Coronation and including those centres.

Apply to the Administrator of Student Awards by August 1.

The Federated Pipe Lines Ltd. Scholarship of $500 is offered in each even numbered year to a student of outstanding academic merit entering the first year of any Faculty of the University of Alberta. The scholarship is subject to renewal for three further years or until graduation whichever is less, providing a satisfactory academic standing is maintained.

Apply to Administrator of Student Awards by August 1.

The Federated Co-operatives Ltd. Matriculation Bursary of $375 will be offered annually to a matriculant entering the University of Alberta at Edmonton in any degree program. The award will be based on Grade XII standing and financial need.

Apply to Administrator of Student Awards by August 1.

The Friends of the University Matriculation Bursaries of $500 each will be offered to three students from Alberta High Schools, other than those of the City of Edmonton, the City of Calgary or within 20 miles of that City or in Banff National Park, on a basis of matriculation standing and finanacial need. Grades X to XII inclusive must have been completed in not more than four years.

Apply to Administrator of Student Awards by August 1.

General Motors Scholarship—General Motors Companies operating in Canada offer annually one matriculation scholarship to an outstanding student who is entering any program at the University of Alberta, the University of Calgary. The scholarship may be renewed up to a maximum of four years, providing the recipient maintains a high standard of scholarship (at least 75%). If the student's scholarship falls below this, the award may be transferred to another qualified candidate.

The size of the award will be determined by the recipient's financial need, and may vary from $200.00 to $2,000.00 per year. A grant-in-aid of $500.00 for each scholarship will be paid to the University.

Applicants must be citizens of Canada. The basis of award will be high scholastic standing and personal qualities. A General Motors Scholar may not hold any other major award.

Apply to the Administrator of Student Awards by August 1.

The C. O. Hicks Matriculation Scholarship of $200.00 provided by alumni, teachers and former teachers of Victoria Composite High School, will be awarded annually to a matriculating student who has attended this High School for at least two years including the graduating year. The bases of award will be academic merit and qualities of good citizenship. The award will be paid $100.00 entering first year and $100.00 entering second year dependent on satisfactory completion of first year.

Applications should be made by letter to the Principal, Victoria Composite High School by September 1. Applicants must provide proof of academic standing and of admission to the University.

The Hudson's Bay Oil and Gas Company Limited Bursary in Engineering. A bursary of $400 per year for four years will be awarded to an outstanding matriculant entering the Faculty of Engineering at Edmonton. The award will be granted on the basis of scholastic achievement, personal qualities and character with due consideration to financial need and the applicant must state an intent to study engineering related to the petroleum industry. (The first award was made in 1964 and the next one will not be made until completion of the first one.) In addition the donor will provide a grant-in-aid of $100 per year to the University.

Apply to Adminstrator of Student Awards by August 1.

The Imperial Order Daughters of the Empire Matriculation Bursaries—The Provincial Chapter of Alberta, Imperial Order Daughters of the Empire, has provided four bursaries for matriculating students, known as the Coronation Bursaries, of the value of $750.00 each payable $350 in the first year and $200 in each of the second and third years. These are tenable in a degree program at the University of Alberta, the University of Calgary or at a Junior College affiliated with either University and are each made in three yearly payments. Two of the bursaries are reserved for children of men or women who served overseas with the British forces during the Great Wars. All candidates must have resided in the province of Alberta for at least three years prior to application.

The provincial educational secretary of the Imperial Order Daughters of the Empire will notify the high schools in February of each year, of the impending award, all applications to be in her possession by June 1. Further information and application blanks may be obtained from Mrs. D. F. Rutherford, 5452-111A Street, Edmonton, Alberta.

The Imperial Order Daughters of the Empire Lethbridge Municipal Chapter Bursary of the value of $500.00 is offered annually to a matriculant in memory of the veterans of both World Wars. This bursary is tenable at the University

of Alberta or at Lethbridge Junior College and is payable over a period of three years: $200.00 the first year, $150.00 each year for the second and third years. The bursary is open to application from children of men or women who served with the Canadian or British Armed Forces during either the First or Second World Wars, and who have attended a Lethbridge High School for at least two years prior to making application. The Lethbridge Municipal Education Secretary will notify the High Schools in October of each year of the impending award, all applications to be in her possession by May 1. Further information and application blanks may be obtained from Mrs. Owen Williams, Municipal Education Secretary, Lethbridge Municipal Chapter, I.O.D.E.,, 532 - 15 St., South, Lethbridge, Alberta.

The Inco Scholarship of $300 plus fees, provided by International Nickel Company of Canada, Ltd., will be offered annually to a matriculant of outstanding merit who is entering first year at the University of Alberta in Engineering, Mathematics, Chemistry, Physics, Geology or Geophysics. Preference, if possible will be given to Mining or Metallurgy. The award is renewable to a maximum of four years providing the holder maintains satisfactory standing. In addition the donor provides a grant to the University of up to $500, the total not to exceed $1,200.

Apply to Administrator of Student Awards by August 1.

The Interfraternity Council Scholarship of the value of approximately $400.00 is offered annually by the University of Alberta Interfraternity Council to a matriculant of outstanding merit entering the first year of any degree or diploma program at the University of Alberta, Edmonton. The money is provided from the proceeds of the annual Interfraternity Songfest. The extra-curricular activities of the student during high school will be considered in making this award.

Apply to Administrator of Student Awards by August 1.

The Masonic Bursaries of $500 each are offered by the Grand Lodge of Alberta, AF and AM, to students from Alberta High Schools to attend the University of Alberta, the University of Calgary, or a Junior College affiliated with either University or any other recognized University if the program of studies is not available at the University of Alberta. A variable number up to a maximum of sixteen may be given. A limited number of these may be renewable, conditional on continued financial need.

Apply to the Grand Secretary, Grand Lodge of Alberta, AF and AM, 330-12 Avenue, S.W., Calgary. Application forms must be completed and returned by April 30.

The Melton Real Estate Limited Scholarship of $350.00 will be offered annually to a student with high scholastic standing from an Alberta High School who is entering first year Faculty of Business Administration and Commerce, University of Alberta.

Apply to Administrator of Student Awards by August 1.

The Pacific Resins Ltd. Customers' Scholarship, of $300.00 is offered to a student entering the first year at the University of Alberta in Education or Engineering.

The award will be made on the basis of high school record, financial need, and extra-curricular activities. Depending upon the holder's record during the first year, the company may decide to renew his scholarship.

Apply to the Administrator of Student Awards by August 1.

The Dr. A. J. Pauly Deferred Scholarships in Medicine. A number of scholarships of $600 each will be awarded to outstanding matriculants who state an intention to proceed into the Faculty of Medicine at the University of Alberta. The awards will be based on Alberta Grade XII standing or its equivalent but the scholarships will be paid only on admission to the second year of the Faculty following completion of the first year with an average of not less than 70%.

Apply to Administrator of Student Awards by August 1.

The Peace River Pioneer Memorial Bursaries, provided by Mr. Charles Plavin of North Star, Alberta, may be awarded to High School graduates whose homes lie north of Township 68 and west of the 5th Meridian in the Province of Alberta and who are proceeding into first year of the University of Alberta or of any institution of university level affiliated with the University and located in the above area. The awards may be variable in amount and will be made on a basis of high academic standing and financial need.

Apply to Administrator of Student Awards by August 1.

The Royal Canadian Legion Scholarship, valued at $400.00 is offered by the Dominion Command of the Royal Canadian Legion, B.E.S.L., for study in a degree or diploma program at University of Alberta on the basis of scholastic ability and financial need, and according to the following priorities: (1) to a son or daughter of a member of the armed forces or merchant navy who lost his or her life during, or as a direct result of, hostilities in the War of 1939-45; or (2) to the son or daughter of a member of the said forces or merchant marine who was seriously incapacitated either physically or mentally; or (3) to the son or daughter of any man or woman who served in any of His Majesty's or Allied forces during 1939-45. Failing the receipt of applications from the above-mentioned groups, consideration will be given to applications from (4) sons or daughters of native or naturalized Canadians domiciled in Alberta.

Apply to the Administrator of Student Awards by August 1.

The Service Rig Division, C.A.O.D.C. Bursaries of $500 each will be offered to four matriculants entering first year University of Alberta on a basis of academic standing in Grade XII and financial need. Preference will be given to student entering Engineering, Business Administration and Commerce or Geology.

The Robert David Sinclair Scholarship in First-Year Agriculture of $150.00 in memory of Robert David Sinclair, late Dean of the Faculty of Agriculture, is offered by his family to a student entering first year of this Faculty.

The scholarship is open to students from schools of agriculture and high schools in Alberta and will be awarded on the basis of scholastic standing.

Apply to the Administrator of Student Awards by August 1.

The Society of Exploration Geophysicists Scholarships—The Society offers annually four scholarships of $500.00 each to Canadians majoring in Geophysics

at Universities in Canada. The award will be based on academic record and financial need. Applicants may be matriculants entering first year University or undergraduates or graduate students.

Application forms may be secured from Canadian Society of Exploration Geophysicists Scholarship Sub-committee, P.O. Box 117, Calgary, Alberta, and should be returned completed to the same address by March 15.

The Steel Company of Canada Bursary of $500 per annum is offered annually to a student entering first year at the University of Alberta, in any degree or diploma course. The bursary will be renewed each year for four years or until the student has completed his or her course whichever is less, provided a satisfactory academic standing is maintained. The financial need of applicants is to be considered. Applicants must be permanent Canadian residents and must have completed the final year of High School in one year. In addition a grant-in-aid of $500 per annum in respect of each bursary will be paid to the University.

Apply to the Administrator of Student Awards by August 1.

The Robert Tegler Matriculation Scholarships—The Robert Tegler Trust provides annually three scholarships of the value of full fees for three years in any Faculty of the University of Alberta, to the three students from High Schools in the City of Edmonton with the highest average standing in the regular examinations of Grade XII for matriculation (not less than 80%). Applicants must be Canadian citizens or British subjects, must have completed Grades X to XII in not more than four years in the Province of Alberta and at least Grade XII in an Edmonton High School. Second class standing must be achieved in order to continue holding the scholarship.

Apply to the Administrator of Student Awards by August 1.

The Robert Tegler Special Scholarships—The Robert Tegler Trust has provided three special scholarships of tuition fees plus $300 for handicapped students tenable in any faculty to which the student can be admitted, and available to new students or continuing undergraduates. While due weight will be given to the academic record of candidates, special consideration will be given to their background, financial need, nature of handicap, personal qualities, and other relevant points. The scholarships may be awarded to the same students a second time, or even throughout the whole undergraduate course.

Apply to the Administrator of Student Awards by August 1.

Applicants must supply a medical certificate with the application.

The University Women's Club of Edmonton Scholarship of $600.00 is awarded annually to a woman student of outstanding merit entering the first year of a degree program at the University of Alberta. It may be held concurrently with any other award or awards and will be given to the woman student with the highest average standing (at least 85% in the June matriculation examinations Grade XII) in Alberta who by accepting it will not forfeit any other award (or portion thereof) of an equal or greater value than this scholarship. It is payable $400.00 in the first year, and $200.00 in the second year, provided that she obtains at least 75% in her first year.

Apply to the Administrator of Student Awards by August 1.

The Hon. W. C. Woodward Scholarship of $500 per year is offered annually in competition to sons, daughters and legal dependents of full-time employees, of retired employees, and of employees who died while in the service of a Woodward Store. It is open to matriculants entering any degree or diploma program at the University of Alberta or the University of Calgary. The bases of award will be scholastic standing in the required subjects of senior matriculation in Alberta or equivalent standing as accepted by the University, activity and interest in youth organizations, and outstanding qualities of citizenship, leadership and service.

The scholarship will be renewable each year up to a maximum of five years of undergraduate study, provided that the holder's academic standing and general conduct are satisfactory to the University.

Application forms are available from the Personnel Department of any Woodward Department Store and should be completed and returned to the same Department by July 15.

UNDERGRADUATE AWARDS

Note On New Grading System

It is anticipated that a new grading system at the University of Alberta, Edmonton, will be in effect for the 1966-67 academic year. The present references to percentage marks or averages in various terms of awards will be interpreted as the considered equivalent in the new system.

GENERAL

The following prizes, scholarships and bursaries are available to students in any faculty of the University:

University of Alberta First Class Standing Prizes. The Board of Governors of the University offers annually a prize of $50.00 to each undergraduate student in a degree or diploma program at the University of Alberta, who, in the work of the preceding year at the University or at a Junior College affiliated with this University, obtained an average standing of 80% or better based on a full normal academic load or the equivalent in Summer School and/or Evening Credit. The money will be paid only if the student returns to the University in some student capacity which involves the assessment of a tuition fee.

The Province of Alberta Undergraduate Scholarships (The Queen Elizabeth Education Scholarship Fund)—The Province of Alberta, under the Students Assistance Act, provides scholarships to undergraduate students who are bona fide residents of Alberta, on a basis of academic achievement in the previous year at the University of Alberta, the University of Calgary or at a Junior College affiliated with either University provided that this shall be 75% or better. They are tenable only at such institutions.

The basic amount of the scholarship is $100, but this may be increased according to the financial need of the students, to a maximum which may in some cases be as high as $1,250. Application may be made for the basic $100 without evidence of financial need. If the application is for more than $100, the form must be filled in completely in order to indicate the amount of financial need.

Students attending at Edmonton should apply to Administrator of Student Awards, University of Alberta, Edmonton. Application must be made on the Provincial Government form.

University of Alberta War Memorial Scholarships—See details given under Matriculation Scholarships.

The Robert Tegler Special Scholarships—See details given under Matriculation Scholarships.

The City of Calgary Undergraduate Scholarships. Two scholarships of $500.00 each are offered annually by the City of Calgary to Calgary students entering the second year at any approved university. The awards will be made on the basis of proficiency and financial need.

Written application setting forth the financial ability of the home and other pertinent information should be received by the City Clerk, Calgary by June 10 on forms available at the office of the City Commissioner, Calgary.

The City of Edmonton Undergraduate Scholarships. Four scholarships of the value of $300.00 each are offered annually by the City of Edmonton to undergraduate students in any year of any Faculty in the University of Alberta at Edmonton. Two of these are restricted to students who have attended Edmonton Schools from Grade X to Grade XII. The basis of award will be academic standing and financial need.

Apply to the Administrator of Student Awards by June 15.

Summer Session Students' Union Prizes. Four prizes of $100 each will be offered annually to students graduating from the University of Alberta, Edmonton, with a Bachelor's degree for which the final requirements were completed by Summer Session. The awards will be made to those with the highest averages on the last five full-year courses (or equivalent) taken in Summer Sessions at the University of Alberta and counted towards the degree, provided that the averages are not less than 75%.

The Interprovincial Pipe Line Company Bursaries of a total annual value of $2,500 are provided to assist undergraduate students of any faculty who have financial need and who have a high academic standing.

Apply to the Administrator of Student Awards by June 15.

The Procter and Gamble Company Bursaries, of a total annual value of $1,500 are provided to assist undergraduates of any faculty who are in need and have a high academic standing. In addition the Company provides an annual grant of $600 to the University.

Apply to the Administrator of Student Awards by June 15.

The Samuel J. McCoppen Bursaries of a total annual value of $1,800.00 are provided under the will of the late Samuel J. McCoppen for undergraduates who have completed the first or second year at the University of Alberta. The basis of award will be financial need and high academic standing.

Apply to the Administrator of Student Awards by June 15.

The IBM-Thomas J. Watson Memorial Bursaries of a total annual value of $1,000.00 are provided by International Business Machines Company Limited for undergraduates in any year or faculty who are in need of financial assistance and who have a high academic standing. In addition, the donor provides an annual grant-in-aid of $500.00 to the University.

Apply to the Administrator of Student Awards by June 15.

The J. M. MacEachran Essay Prizes are offered annually by the Philosophical Society of the University at Edmonton. The essay competition of the society is open to all undergraduate students and prizes are awarded for the best three essays.

Full details of the competition are announced each year by the Philosophical Society.

The Westward Ho! Chapter I.O.D.E. Memorial Awards of $65 each, endowed by the Chapter in Memory of Mrs. Cora Casselman, Mrs. J. M. Forbes and Mrs. W. C. Redmond, will be offered annually to not more than three students toward the expenses of attending the Banff Conference on World Development

held in August of each year. Selection will be made by a special committee on a basis of interest in this field of study and academic standing. Undergraduates or students in the first year of graduate study may apply.

Apply to Administrator of Student Awards by March 1.

C.U.S. Interregional Exchange Scholarships. By arrangement between certain Canadian universities undergraduate or graduating students may apply for a year's study at another university in a region other than that in which the student is attending. The four regions are: Western, English Central, French Central and Atlantic. Applicants must be bona fide students who have completed at least one year of university work beyond complete senior matriculation. They may return to their home university after the exchange year or remain at their own expense. Successful candidates will be accorded remission of tuition fees for the exchange year. Travel assistance will be provided by C.U.S. (through a grant from Canada Council). Academic standing and extra-curricular activities will be considered.

Application forms may be had from the C.U.S. campus representative or the Administrator of Student Awards and must be filed by January 31.

The German Academic Exchange Scholarship is offered annually by the Federal Republic of Germany to a student from the University of Alberta. Applicants must be Canadian citizens, have a first degree by the date of tenure, be between 20-30 years of age, and be fluent in the German language.

The scholarship is tenable for 12 months beginning October 1 at a University or at an Academy of Art or Music. The scholarship covers tuition fees, partial travel costs and living allowance.

Apply by letter to the Administrator of Student Awards by December 1 so that completed applications may be in Ottawa by December 31. Letter of application should give academic background, study plans in Germany and projected plans after return.

The French Government Scholarships. The government of the French Republic offers annually a number of scholarships for Canadian graduates to provide for study at a French university. There is no restriction on field of study provided the candidate has an adequate knowledge of French. The awards are for one academic year and cover tuition fees, a living allowance and sea passage from France to Canada at the conclusion. The awards are made by the Cultural Counsellor of the French Embassy in Ottawa, on the nomination of the University.

Apply to the Head, Department of Romance Languages, Edmonton by Feb. 1.

The Bank of Nova Scotia Bilingual Exchange Scholarships. Six awards will be made annually, three to French-speaking candidates and three to English-speaking candidates. Values are $1,500 for undergraduates and $2,500 for graduate students. Undergraduate awards are tenable in the second last year of a normal undergraduate program. English-speaking winners may attend any Canadian French-speaking university or college and French-speaking winners may attend any Canadian English-speaking university or college, provided that such institution is a member, or federated with, or affiliated to, a memeber of the Association of Universities and Colleges of Canada.

Apply to Director of Awards, Association of Universities and Colleges of Canada, 151 Slater Street, Ottawa 4, Ontario. Completed applications must be filed by March 15.

Extracurricular Awards

The following awards are based mainly on extracurricular activities. They are awarded by special committee and will be announced each year at Colour Night.

Lorne Calhoun Memorial Award—The winner of this award, selected by a special committee made up of members of the Administration and Council executive, is a person who has made an outstanding contribution to student life in a broad variety of activities, and whose academic standing is satisfactory. The current President of the Students' Union is not eligible. The distinctive silver shield was first awarded in 1952 to perpetuate the memory of Lorne Calhoun, B.A., a student of the University from 1946 until his death in 1951, who during that time was most active in extracurricular activities.

The Maimie Shaw Simpson Trophy in honor of Miss Maimie Shaw Simpson, first Dean of Women of the University of Alberta, will be awarded annually beginning in 1960. To qualify a candidate must be a woman member of the Student's Union, have obtained at least a second class standing in the previous academic year and have made an outstanding contribution to student life in a broad variety of activities.

The Walter Andrew Dinwoodie Award consisting of a plaque plus $100.00 will be awarded annually, in memory of Mr. Dinwoodie, Business Manager of the Students' Union 1949 to 1962, by the Students' Union of the University of Alberta, Edmonton, to an undergraduate in the second or subsequent year who is returning to the University of Alberta, Edmonton, the following year in a full-time program. The basis of award will be satisfactory academic standing and an outstanding contribution to some phase of extracurricular activity, under the direction of the Students' Union, in the academic year in which the award is made.

The Joseph Dolson Oliver Mothersill Memorial Awards of the value of $200 each will be awarded annually to two students, one man and one woman, selected for outstanding contribution to student life in the University, especially through good citizenship and active support of student government.

The Women's Canadian Club of Edmonton Award of $100 will be given annually to a woman student in any program at the University of Alberta, Edmonton. The award will be based on outstanding extracurricular activities and a satisfactory academic record in her previous years. The award will be dependent on the student returning for full-time studies at this University in the following academic term.

The Florence E. Dodd Prize of $50.00 is awarded annually to a woman student selected for satisfactory academic work and outstanding contribution to student life in the University through active participation in extracurricular activities.

The Reg. Lister Trophy and Prize—The Trophy and a cash prize of $50.00 will be presented annually to a male resident student who in the opinion

of the Men's Residence Committee, in consultation with the Warden, has made a significant and worth-while contribution to residence life, and who has maintained a satisfactory academic standing.

Block A Club Athletic Award of the value of $100.00 is offered by the Block A Club to a first year male student deemed outstanding in intercollegiate athletics.

The basis of the award will be athletic achievement and satisfactory academic standing (not less than 65%), as determined by all term examinations held prior to Colour Night. The award will be dependent on the student entering the second year at the University of Alberta.

Selection will be made by a committee appointed by the Block A Club.

Prizes and scholarships available in the various faculties are listed below according to faculty.

THE FACULTY OF ARTS

The Governor-General's Gold Medal is awarded by His Excellency, the Governor-General, to the graduating student in an honors program from the Faculty of Arts who has shown the highest distinction in scholarship.

The Dr. John Macdonald Gold Medal in Arts named in honor of the former Dean of Arts and Science is awarded annually to the graduating student from the general program in the Faculty of Arts who has shown the highest distinction in scholarship.

The Board of Governors of the University Scholarship of $100.00 will be awarded to a student of outstanding merit in the first year of the Faculty or Arts, Edmonton, provided that an average of at least 75% is attained.

The Frederick A. Scherrer Scholarship in Arts of $500 will be awarded annually to a student of outstanding merit entering the fourth year of an honors program in the Faculty of Arts.

The Mary Cameron Douglas Memorial Scholarship, valued at $450.00, is available to a student of outstanding merit who is entering the fourth year of an honors program in the Faculty of Arts at Edmonton. The right is reserved to withhold the scholarship in any year if there is no candidate of sufficient merit.

The John Mills Imrie Memorial Scholarship of $300 will be awarded annually for 10 years beginning 1963 to a student of outstanding merit completing the first year of the Faculty of Arts at Edmonton.

The Edmonton Section of the Council of Jewish Women Scholarship of $100 will be awarded annually to the student with the highest standing in the second year of the honors program of the Faculty of Arts in Edmonton, provided an average of not less than 75% has been attained.

The Dr. Geneva Misener Memorial Scholarship of $300.00 provided under the will of the late Dr. Misener will be offered annually to a student of outstanding merit completing the third year of an honors program in Classics or Modern Languages at Edmonton provided first class standing has been achieved on the year's work.

The President's Scholarships—Three scholarships of $450.00 each were endowed in 1943 by Standard Investments Limited through the late Mr. Justice H. H. Parlee. These scholarships are open to undergraduates in the faculties of Arts, Science and Law. Proficiency in studies is the primary basis of award, and no award will be made to a student with less than 80%. Preferably these three awards will be given, one in a B.A. program, one in a B.Sc. program and one in Law. If the number of well qualified candidates exceeds the number of scholarships available, financial need will be taken into account in making the awards.

Apply to the Administrator of Student Awards by June 15.

The Renkenberger Scholarship of $250, provided under the will of the late Harvey Renkenberger of Barons, Alberta, will be awarded to an undergraduate student in the Faculties of Agriculture, Arts, Science, Education or Commerce who is especially interested in co-operative marketing. The basis of award will be academic standing and participation in relevant extra-curricular activities. The recipient should include in his program a senior course in economics preferably related to agriculture or marketing.

Apply to Administrator of Student Awards by June 15.

The Sunwapta Broadcasting Company Scholarship, of the value of $200 is offered by Dr. G. R. A. Rice to an outstanding student in Edmonton who is interested in the field of electronics communications, as related to the Broadcasting and Television industry.

The award will be made to a student entering the fourth year in Electrical Engineering, or Honors Physics, or to a student entering the third or fourth year of a B.A. program who has displayed an active interest in student journalism, or in broadcast script writing.

Apply to Administrator of Student Awards by June 15.

THE FACULTY OF SCIENCE

The Lieutenant Governor's Gold Medal is awarded by his Honor, the Lieutenant Governor of Alberta, to the graduating student in an honors program from the Faculty of Science who has shown the highest distinction in scholarship.

The Dean's Gold Medal in Science is awarded annually to the graduating student from the general program in the Faculty of Science in Edmonton who has shown the highest distinction in scholarship.

The Frederick A. Scherrer Scholarship in Science of $500 will be awarded annually to a student of outstanding merit entering the fourth year of an honors program in the Faculty of Science.

The Aluminum Company of Canada Limited Scholarship of $500 is offered annually to an undergraduate student in Chemical, Mechanical or, Electrical Metallurigical Engineering or in Honors Chemistry, Physics or Mathematics. The award will be based on academic standing, financial need and general character of the applicant and may be held by the same student more than one. In addition the Company will provide a grant-in-aid of $300 to the University.

Apply to Administrator of Student Awards by June 15.

The Board of Governors of the University Scholarship of $100.00 will be awarded to a student of outstanding merit in the first year of the Faculty of Science, Edmonton, provided that an average of at least 75% is attained.

The James McCrie Douglas Memorial Scholarship, valued at $450.00, is available to a student of outstanding merit who is entering the fourth year of an honors program in the Faculty of Science at Edmonton. The right is reserved to withhold the scholarship in any year if there is no candidate of sufficient merit.

The Edmonton Lodge of B'nai B'rith Scholarship of $100.00 is awarded to the student with the highest standing in the second year of the honors program in the Faculty of Science in Edmonton. The record in the first year will also be taken into account.

The Hamilton Watch Company Award consisting of an engraved watch and a certificate will be awarded annually to a student of outstanding merit graduating from a B.Sc. Honors program of the Faculty of Science. The achievements of the student—either academic or extracurricular—in the Social Sciences or Humanities will be considered in making this award.

The Kenneth William Moodie Scholarship—As a memorial to her nephew, Flying Officer Kenneth William Moodie, a graduate in science of the University of Alberta who lost his life in May, 1942 while on operations, the late Miss Marion E. Moodie made provision in her will for an annual scholarship of $200.00 to a student of outstanding merit entering the first year of the Faculty of Medicine or the third year of the B.Sc. program in the Faculty of Science in Edmonton. The basis of award will be academic attainment on the previous year's standing at the University of Alberta, financial need and evidence of satisfactory personal qualities.

Apply to the Administrator of Student Awards by June 15.

The President's Scholarships—See under the Faculty of Arts.

The Renkenberger Scholarship—See under the Faculty of Arts.

The Sunwapta Broadcasting Company Scholarship—See under Faculty of Arts.

AWARDS IN DEPARTMENTS

(**Note:** Awards in specified courses are open to students of other faculties registered in these courses.)

ART

The Fuller Brush Company Scholarship in Art—One scholarship of $200.00 will be awarded to a student of outstanding merit in Edmonton, who is entering either the second or third year of the B.A. in Art or the Bachelor of Fine Arts, or the third or fourth year of the Faculty of Education, majoring in Art, provided that such student is registered in a full year's program.

The University of Alberta Alumni Prize in Fine Arts of $100.00 is offered annually by the General Alumni Association to the student in the B.A. in Art or the Bachelor of Fine Arts in Edmonton who has demonstrated the best progress. Financial need will be considered in making the award.

Biochemistry

The Society of Chemical Industry Merit Awards. Three awards will be made annually consisting of a gold key bearing the crest of the Society and a year's subscription to "Chemistry and Industry". The awards will be made to the student graduating with the highest standing in each of Honors Chemistry, Honors Biochemistry and Chemical Engineering, provided an average of 75% is attained in the final year and that the program has been completed in the normal number of years.

Botany

The J. E. Olsen Prize, of the value of $35.00, is offered to the graduating student who has taken the highest average mark in two or more senior botany courses, provided that the student's general record is satisfactory to the Faculty Council.

Chemistry

The Professor Osman James Walker Memorial Scholarship of $150 is awarded annually to the student selected by the Department of Chemistry at Edmonton who is graduating from the University of Alberta in the general or honors program and who will be proceeding to graduate work in the Department of Chemistry at the University of Alberta. Applications for this award must be received by the Department before May 1.

In the event that no suitable applicant is selected, the award will go to the student graduating with the highest record in the fourth year of the honors chemistry program.

The Society of Chemical Industry Merit Awards. Three awards will be made annually consisting of a gold key bearing the crest of the Society and a year's subscription to "Chemistry and Industry". The awards will be made to the student graduating with the highest standing in each of Honors Chemistry, Honors Biochemistry and Chemical Engineering, provided an average of 75% is attained in the final year and that the course has been completed in the normal numbers of years.

The Chemical Institute of Canada Prize in Chemistry. A prize of $25 in books will be awarded to the student in Honors Chemistry who obtains the highest standing in the work of the third year, provided that such student's record is otherwise satisfactory to the Faculty Council.

The Lehmann Prize in Chemistry, of the value of $50.00 in books, is offered annually by the estate of the late Dr. A. L. F. Lehmann, formerly head of the Department of Chemistry in the University. It is awarded to the student making the best record in Chemistry 230 in Edmonton, provided the student otherwise secures a standing satisfactory to the faculty council.

The Fred H. Irwin Memorial Prize in Organic Chemistry—As a memorial to their son, Flying Officer Fred H. Irwin, a graduate in Honors Chemistry of the University of Alberta, May 19, 1941, who lost his life March 19, 1945, while on operations, Mr. and Mrs. Leslie H. Irwin have made provision for an annual prize of $40.00 in professional books to be awarded to the student making the best record in Chemistry 550 in Edmonton.

Classics

The Emily Sereth Lieberman Memorial Prize in Classics of $150, endowed by the family and friends of the late Mrs. Lieberman, will be awarded annually to a student for outstanding merit in Classics 350 provided the student's record is otherwise satisfactory.

The Ahepa Prize in Greek—A prize of $50.00 is offered by the Anglo-Hellenic Association in Western Canada to the student in Greek 200 or Greek 300 who secures the highest standing in a special examination in sight translation from English to Greek and from Greek to English, subject to the provision that the prize be granted to the successful candidate only if he or she continues in a course in senior Greek in the year immediately subsequent to the year in which the prize is won. If there is no suitable candidate from Greek 200 or Greek 300, the Department of Classics may at their discretion award the scholarship to a student in other courses in Greek.

The Monica Jones Aamodt Prize in Classics 354 of $50.00 in books, is offered annually by the Delta Delta Delta Alumnae of the University of Alberta in honor of Mrs. Monica Jones Aamodt, the organizer of the fraternity on this campus. The prize is to be awarded to the student in Edmonton obtaining the highest mark in that course, provided that the standing obtained meets with the approval of the Faculty Council.

Drama

The Lerner Scholarship in Drama—A scholarship of $100.00 is offered annually by Mr. A. I. Lerner, in memory of his son, Irving Lerner. It is awarded to a student of outstanding merit enrolled in Drama 350 (Advanced Acting). To be eligible, a student must be majoring in Drama in the Faculty of Arts or Education. The payment of this scholarship will be contingent upon the student entering a further year of training in drama either at the University of Alberta or at another recognized college or university.

Economics

The Duncan Alexander MacGibbon Gold Medal in Economics will be awarded to the student graduating from the Honors Economics program with highest distinction.

The Men's Economics Club Book Prize, valued at $25.00, is offered to the student taking the highest standing in Economics 200 at Edmonton, provided such student's academic record is satisfactory to the Faculty Council.

English

The Rutherford Memorial Gold Medal—is offered in memory of the late Honorable Alexander Cameron Rutherford to a student of outstanding merit in the graduating year who attains first class standing in honors English.

The Aiken Scholarship in English Language and Literature, of the value of $100, is the gift of the late Sir James Aiken. The scholarship will be awarded to a student of outstanding merit who is entering the third year of the honors

English program. In no English course may the student fall below second-class standing.

The Priscilla Hammond Memorial Scholarship in Honors English, of the value of $500.00, is awarded to the student entering upon his or her final year in honors English who, in the judgment of the Department of English, shows the greatest ability and promise in the field of English scholarship or in creative work in English. The right is reserved to withhold the scholarship in any given year if there is no candidate satisfactory to the department.

The F. M. Salter Memorial Scholarship in Renaissance Literature of $100, made available by friends of the late Dr. Salter, will be offered to a student in Edmonton for outstanding merit in English 324 or 332 or 390 provided that the student's academic record is otherwise satisfactory.

The James Patrick Folinsbee Prize of the value of $100.00 is offered annually to the student in English 396 whose writing shows greatest merit provided the student's general University record is satisfactory.

The Samuel Richard Hosford Memorial Prize, of $50.00 is awarded to the undergraduate student making the best record in English 332.

The J. T. Jones Prize in Milton of $50, instituted by friends of John Thomas Jones in recognition of his service in the Department of English from 1922-1964, will be awarded annually to the student with the highest standing in English 340, provided his academic record is otherwise satisfactory. If there is no suitable candidate, no award will be made.

The Charles James Thompson Memorial Prize in English 210, of the value of $20.00 in cash is awarded to the undergraduate student in the Faculty of Agriculture making the best record in English 210, provided that the student is taking a full year's work and passes all subjects.

Beta Sigma Phi, Canadian Chapter offers annually three scholarships of $1,000.00 each, one of which is restricted to the Western Canada region. The scholarships will be tenable in the fourth year of an Honors Course in English. They will be awarded at the end of the third year on a basis of academic accomplishment and a confidential assessment of the student's ability by his or her teachers in English courses.

Apply to The Director of Awards, Association of Universities and Colleges of Canada, 151 Slater Street, Ottawa, 4, Ontario, by June 1.

Entomology

The Entomological Society of Alberta Prize—An annual prize of $50.00 is offered by this Society to the student obtaining the highest standing in one or more senior courses in the Department of Entomology. The Award is conditional on a satisfactory general record.

Geography

The Canadian Association of Geographers' Book Prize—An award will be granted annually to the graduating student who has specialized in Geography and who has demonstrated the greatest proficiency in this subject.

The Alberta Geography Prizes are offered annually by Mr. Donald C. Lofquist, M.A. as follows:

1. One prize of the value of $50.00 in books, and a one-year student membership in the Canadian Association of Geographers, to be awarded to the freshman student receiving the highest mark in Geography 201, provided the student is carrying a full year's work and passes in all other subjects.
2. One prize of the value of $50.00 in cash, and a one-year student membership in the Canadian Association of Geographers, to be awarded to the second year student in Edmonton specializing in Geography who receives the highest mark in Geography 300 and Geography 301, provided the student is carrying a full year's work and passes in all other subjects.
3. One prize of the value of $50.00 in cash, and a one-year student membership in the Canadian Association of Geographers, to be awarded to the third year student in Edmonton specializing in Geography and who has shown the greatest proficiency in Geography provided the student is carrying a full year's work and passes in all other subjects.

Geology

The Association of Professional Engineers of Alberta Gold Medal in Geology is offered to the student with the highest general standing in the final year of Geology. This award may be given to a student graduating in either the three year general course or the four year honor course, provided that an average standing of at least 75% is attained.

The Association of Professional Engineers of Alberta Scholarship in Geology and Physics of the value of tuition and fees is offered annually to a student of outstanding merit entering the third year of a program at the University of Alberta leading to a B.Sc. (Honors) in Geology and Physics.

The Chevron Standard Limited Geophysical Scholarship, valued at $400 is offered annually to a student of outstanding merit who is entering the third year of Honors Geology and Physics, or Honors Physics (Geophysics option), and who is interested in oil exploration or production. Preference will be given to a male Canadian citizen.

Apply to the Administrator of Student Awards by June 15.

The Chevron Standard Limited Scholarship in Geology of $400 is offered annually to a student of outstanding merit entering the final year of Honors Geology who is interested in oil exploration or production. Preference will be given to a male Canadian citizen.

Apply to the Administrator of Student Awards by June 15.

The Association of Professional Engineers of Alberta John A. Allan Memorial Scholarship in Geology of the value of tuition and fees is offered annually by the Association in memory of Professor John A. Allan. The award will be made to the student who obtains the highest standing in all the prescribed courses of first year Geology.

The P. S. Warren Prize in Geology of $100, provided by the Edmonton Geological Society, will be awarded to a non-graduating student for outstanding

achievement in Geology 201 at Edmonton, provided the student's record is otherwise satisfactory.

The Alberta Society of Petroleum Geologists' Prize in Stratigraphy is offered annually to the undergraduate student, who, in the opinion of the Department of Geology, has made the most progress in the study of stratigraphical geology. The prize will consist of a copy of "The Western Canada Sedimentary Basin" and a gift certificate entitling the recipient to his selection of the Society's publications to the value of $50.00.

Germanic Languages and Linguistics

The German Government Book Prizes are offered annually to two students for outstanding merit in German Literature courses, provided that these students obtain an average of not less than 75% in these courses, are carrying a full year's work and have a record satisfactory to the Faculty Council. A prize may not be awarded to the same student more than once.

The Minister of Switzerland's Book Prize in German is offered to a student for outstanding merit in senior German Literature courses, providing such student's record is otherwise satisfactory.

History

The Harold W. Riley Memorial Scholarship of $200 will be offered annually to a student of outstanding merit in the Department of History who has shown a special interest in the history of Western Canada, provided his record is otherwise satisfactory.

The John Henry Stanley Memorial Prize of $50.00 has been endowed by Dr. George F. G. Stanley in memory of his father to be awarded annually to a student of outstanding merit in Canadian History, provided this student is taking a full year's work and passes all other subjects.

The Gordon Stanley Fife Memorial Prize of $100, endowed by members of the family, will be awarded to the graduating student at Edmonton who has taken the highest average mark in two or more senior history courses.

The George Malcolm Smith Memorial Book Prize of the value of $50.00, provided by Mrs. M. H. Long, will be awarded to a student of outstanding merit in Modern European History at Edmonton provided that this student takes first-class standing in the course, is carrying a full year's work and passes in all his other subjects.

The Ross William Collins Memorial Book Prize of the value of $50.00, provided by Mrs. M. H. Long, will be awarded to a student of outstanding merit in Renaissance and Reformation History provided that this student takes first-class standing in the courses, is carrying a full year's work and passes in all his other subjects.

The History Club Prize of books of the value of $25.00 is offered by the History Club of the University of Alberta, to the student making the best record in a junior History course in Edmonton, provided such student receives first-class standing on the year's work in history and passes in all other subjects.

The A. L. Burt Prize of books of the value of $25.00 is offered by the History Club in honor of its founder, to a student of outstanding merit in History 450 in Edmonton, provided that the student's general record is satisfactory to the Faculty Council.

The Trenholme Dickson and Letitia S. Dickson Prize of $40.00 is awarded to a studnet of outstanding merit in the field of Canadian History, at Edmonton provided such student has a first-class average in that subject and maintains an otherwise satisfactory standing.

The Morden Heaton Long Prize, of $50.00 is offered annually by friends of the late Professor Emeritus of History to a student of outstanding merit in British History provided that the student's record is otherwise satisfactory.

The Morden Heaton Long Memorial Prize in Honors History of $100 is offered annually by Mrs. Winnifred Long in memory of her late husband, a former head of the Department of History, to the third year honors student with the best record, conditional upon his registration in the fourth year of Honors History.

Mathematics

The A. Wyman Memorial Gold Medal in Mathematics is offered by the family of the late Mr. Wyman to the student in the graduating year of the honors program in Mathematics who secures the highest average standing, provided that the student's record is otherwise satisfactory.

The Cyril G. Wates Memorial Prize of $50.00, offered by Mrs. Wates, will be awarded to a student of outstanding merit in Astronomy 253 or 410. The award will be based on the record in these courses only.

The Ernest Wilson Sheldon Memorial Prize in Mathematics, of the value of $50.00, is offered by Mrs. Sheldon in memory of the late Dr. E. W. Sheldon, Emeritus Professor of Mathematics to a student of outstanding merit completing the third year of honors program in mathematics at Edmonton, provided his general record is satisfactory to the Faculty Council. The award will be based on performance in the mathematics courses of the third year.

The J. W. Campbell Memoral Prize of $50 provided by Mrs. J. W. Campbell in memory of her husband, former Head of the Department of Mathematics, will be awarded annually to a student of outstanding merit in Mathematics 206 in Edmonton provided that the student's record is otherwise satisfactory to the Faculty Council.

The Annie Fefferman Prize in Mathematics to the value of $25.00 in books is offered by the family of the late Mrs. Fefferman to the student making the highest standing in Mathematics 201 in Edmonton provided that the student's general record is satisfactory to the Faculty Council.

Music

The Peace River Pioneer Memorial Scholarship in Music of $300.00, endowed by Mr. Charles Plavin of North Star, Alberta, will be awarded annually to a student of outstanding merit completing the first, second or third year of the

Bachelor of Music program at the University of Alberta, Edmonton. The Department may, at its discretion, divide the award. It is hoped that recipients of these scholarships will be interested in music instruction for school age children.

The Eva Shaw Memorial Prize in Music of the value of $50.00 is offered annually in memory of the late Mrs. Roy Shaw, by her children, to a student of outstanding merit in any year of the Bachelor of Music program in Edmonton.

Philosophy

The MacEachran Gold Medal in Philosophy, offered by Professor Emeritus J. M. MacEachran, will be awarded to the student in the Department of Philosophy graduating with Honors in Philosophy or Philosophy and Greek with the highest standing in the last two years of the course. The medal will be awarded only if the student obtains First Class Honors.

The William Irvine Memorial Scholarship in Ethics of $100 made available by friends of the late Mr. Irvine will be offered to a student in Edmonton for outstanding merit in Philosophy 354 provided that the student's academic record is otherwise satisfactory.

Physics

The Sam Fefferman Memorial Gold Medal in Honors Physics is offered by the family of the late Mr. Fefferman to an outstanding student in the graduating year of the honors program in Physics. The student must have registered in a full year's program and obtain first class honors in Physics.

The Association of Professional Engineers of Alberta Gold Medal in Geophysics is offered to the student with the highest standing in the final year of Geophysics, provided that an average of at least 75% is attained.

The Chevron Standard Limited Geophysical Scholarship, valued at $400 is offered annually to a student of outstanding merit who is entering the third year of Honors Geology and Physics, or Honors Physics (Geophysics option), and who is interested in oil exploration or production. Preference will be given to a male Canadian citizen.

Apply to the Administrator of Student Awards by June 15.

The Canadian Society of Exploration Geophysicists Scholarship of $350 is offered annually to a male student of outstanding merit entering the third or fourth year of the Honors Physics, Geophysics Option program or a closely related field.

The Society of Exploration Geophysicists Scholarships. See details under Matriculation Scholarships.

The Northern Electric Undergraduate Scholarship, which provides an amount not exceeding $500 to cover tuition and general fees and the cost of books for one year, is awarded annually to a student of outstanding merit who is proceeding into the second, third or fourth year of Electrical Engineering or Honors Physics. The applicant must be a Canadian citizen or a landed immigrant and must normally have secured an average of at least 75% on the work of the preceding

university year. Students who have held the scholarship previously are free to apply for renewal of the award.

Apply to the Administrator of Student Awards by June 15.

Political Science

The Duncan Alexander MacGibbon Gold Medal in Political Science will be awarded to the student graduating from the Honors Political Science program with highest distinction.

Psychology

The MacEachran Gold Medal in Psychology, offered by Professor Emeritus J. M. MacEachran, will be awarded to the student in the Department of Psychology, graduating in the B.A. or B.Sc. course with Honors in Psychology with the highest standing in the last two years of the course. The medal will be awarded only if the student obtains First Class Honors.

Romance Languages

The Bronze Medal in French (Edmonton), offered by the French Consul in Alberta will be awarded each year to the student of French 450 who writes the best essay on a contemporary author.

The French Government Book Prize (Edmonton) will be awarded to the student with the highest standing in French 200, provided such student's record is satisfactory to the Faculty Council.

The Belgian Government Book Prize (Edmonton) is offered to the student who obtains highest standing in French 360, provided that the student's record is otherwise satisfactory.

The Minister of Switzerland's Book Prize in French (Edmonton) is offered to the student who obtains the highest standing in French 375 or 380, provided that the student secures standing which is satisfactory to the Faculty Council.

Slavonic Languages

The Royal Canadian Legion, Norwood Branch, Scholarship in Ukrainian. Four scholarships of the value of $100 each, will be awarded annually to students of outstanding merit, three in Ukrainian 100 and one in Ukrainian 300, the awards to be based on the mark of these courses only.

The Ukrainian Catholic Women's Award in the Ukrainian Language of the value of $100.00 is awarded to the student with the highest standing in Ukrainian 100 provided the student's record is otherwise satisfactory to the Faculty Council.

The Ukrainian Women's Association of Canada (Alberta Branch) Scholarship of $100.00 is offered annually to a student of outstanding merit in Ukrainian 300 provided the student's record is otherwise satisfactory.

The Ukrainian Canadian Committee Scholarship of $100 is offered annually to a student of outstanding merit in Ukrainian Literature 360 provided the student's record is otherwise satisfactory.

The Ukrainian National Association Scholarship of $100.00 is offered annually to a student of outstanding merit in Ukrainian Literature 360 provided the student's record is otherwise satisfactory.

Sociology and Anthropology

The Samuel M. Strong Gold Medal or Book Prize in Sociology, in memory of the late Dr. Strong, will be awarded to the student in the Department of Sociology and Anthropology graduating with Honors in Sociology with the highest standing in the last two years of the course. The medal will be awarded only if the student obtains First Class Honors, otherwise a book prize of $25.00 will be awarded.

The Tammy Usiskin Memorial Prize of $50, provided by the Edmonton Section Council of Jewish Women, will be offered annually to a student in the Department of Sociology preferably in the field of Gerontology. It may be awarded on the basis of either an essay for the Departmental publication "Variables" or for outstanding undergraduate course work in this field.

Zoology

The William Rowan Memorial Scholarship of $100.00, in memory of the late Dr. Rowan, former Head of the Department of Zoology, will be offered annually to a student of outstanding merit entering the fourth year of the Honors Zoology program.

THE FACULTY OF AGRICULTURE

The Alberta Institute of Agrologists Gold Medal is offered annually primarily on the basis of scholarship as shown in the two senior years in the undergraduate courses in Agriculture, the weighted average in all subjects to be not less than 75%. Consideration will be given as well to qualities of leadership, personality and character.

The Western Canadian Society for Horticulture Gold Medal. A gold medal and a five-year membership in the Society will be awarded annually to a graduating student from the Department of Plant Science with the best record in Horticulture during the final two years, provided the student's record is otherwise satisfactory to the Faculty Council.

The Frank A. Coates Memorial Prize of $100 endowed by his daughter, Mrs. D. Enilda Peers, will be awarded annually to a student of outstanding merit graduating from the Faculty of Agriculture who has specialized in Horticulture. Preference will be given to a student from a rural home.

The Board of Governors of the University Scholarship of the value of $100.00 is awarded on the basis of the work of the first year in Agriculture, provided that an average of not less than 75% be obtained on the work of the year.

The Dan Baker Undergraduate Bursary of $300 is provided under the will of the late Dan Baker of Edmonton. It may be awarded to a student entering second, third or fourth year of the Faculty of Agriculture on a basis of academic standing, financial need and personal character.

Apply to the Administrator of Student Awards by June 15.

The Douglas Farquhar Johnston Bursaries in Agriculture of the value of $500 each are offered annually to two students entering the final year of the Faculty of Agriculture. Preference will be given to students in the Department of Animal Science. The awards will be based on academic standing and financial need.

Apply to the Administrator of Student Awards by June 15.

The J. K. Sutherland Memorial Scholarship of the value of $100.00 is offered in memory of Mr. and Mrs. Sutherland of Hanna, Alberta, by the Board of F.U.A. District No. 11 and other interested persons. It is to be awarded to a student of outstanding merit completing the third year of the Faculty of Agriculture in the University of Alberta, provided that an average of at least 70% has been obtained in that year.

The Western Co-operative Fertilizers Limited Scholarship of $500 will be offered annually to a Canadian student of outstanding merit entering fourth year, Faculty of Agriculture, in the Department of Soil Science.

The N. A. Larsen Memorial Scholarship of $500.00 will be offered annually to a student of outstanding merit entering the third year in the Faculty of Agriculture who is registered in the Department of Dairy and Food Science in a program of specialization in Dairy Processing. The award will be based on scholastic attainment during the first two University years and is intended to encourage undergraduates in the expanding field of Dairy Technology.

The David Sidey Memorial Scholarship of $500 provided by Miss Isabel Sidey of Olds, is offered annually to a student of outstanding merit whose home is in Alberta and who is entering third or fourth year of the Department of Animal Science in the Faculty of Agriculture.

The Alberta Poultry Producers' Scholarship of the value of $250 is open to undergraduates who have completed the second year in the Faculty of Agriculture and who are registered in Poultry Science. The ward will be for scholarship attainment during the first two university years with a two-year average of not less than 65%. In the event that no suitable person is registered in the third year of this program, the scholarship may be renewed during the fourth year for continued satisfactory work.

The J. Macgregor Smith Scholarship of $500 will be offered annually to a student of outstanding merit entering the third or fourth year in the Department of Agricultural Engineering.

The Canada Packers Scholarship, valued at $500, is offered annually to a student entering the fourth year of Agriculture at the University of Alberta. While preference may be given to a student majoring in a field of general interest to the packing industry, all students with high standing in the work of the third year will be eligible.

The Canadian Feed Manufacturers' Association (Alberta Division) Scholarship of $300.00 is available to a third year student in Agriculture majoring in nutrition in the Department of Animal Science in the third year. The scholarship is to be awarded to the eligible student who has the highest weighted average in courses completed during his second year in the Faculty of Agriculture.

The Alberta Branch of the Canadian Seed Growers' Association Scholarship of $150.00 is made available to a third year student in the Department of Plant Science. The scholarship is to be awarded to the eligible student who has the highest weighted average in courses completed during his second year in the Faculty of Agriculture.

The Robert Gardiner Memorial Undergraduate Scholarship of $200.00 offered by the United Farmers of Alberta in memory of the late Robert Gardiner, will be awarded to the student standing highest in the third year in the Faculty of Agriculture. A weighted average of 75% in all subjects will constitute the minimum scholastic requirement. In addition to academic standing, consideration will be given to qualities of leadership, personality and character.

The scholarship is open only to students from farm homes; preference will be given to students born in Alberta.

The Renkenberger Scholarship—See details under Faculty of Arts.

The Alberta Horticultural Association Scholarship of $100 will be awarded annually to a student of outstanding merit entering the 3rd or 4th years of the Department of Plant Science and specializing in Horticulture.

The Ketchum Prize in Animal Science, valued at $50.00, is offered by the Ketchum Manufacturing Co. Limited of Ottawa. It will be awarded to a student majoring in Animal or Poultry Husbandry for outstanding merit in the work of the third year in the Faculty of Agriculture.

The Entomological Society of Alberta Prize—An annual prize of $50.00 is offered by this society to the student obtaining the highest standing in one or more senior courses in the Department of Entomology. The award is conditional on a satisfactory general record.

The Charles James Thompson Memorial Prize in English 210—See details under Awards in Departments.

THE FACULTY OF BUSINESS ADMINISTRATION AND COMMERCE

The T. Eaton Company Gold Medal in Commerce is awarded annually to the graduating student who receives the highest standing in the courses of the final two years, providing the student's record is considered satisfactory by the Faculty of Business Administration and Commerce.

The Winspear, Higgins, Stevenson and Doane Scholarship of the value of $500.00 is offered annually to a student at the University of Alberta proceeding to the degree of Bachelor of Commerce in Accounting for outstanding merit in the courses of the first and second years. The scholarship will be paid in two equal instalments; the first on registration in the third year and the second on registration in the fourth year. Payment of the second instalment is subject to the student obtaining an average of a least 70% in the courses of the third year.

The Dominion Stores Limited Scholarship of the value of $500.00 is offered annually to a student at the University of Alberta proceeding to the degree of Bachelor of Commerce in Finance for outstanding merit in the courses of the

first and second years. The scholarship will be paid in two equal instalments; the first on registration in the third year and the second on registration in the fourth year. Payment of the second instalment is subject to the student obtaining an average of at least 70% in the courses of the third year.

The Industrial Acceptance Corporation Limited Scholarship of the value of $500.00 is offered annually to a student at the University of Alberta proceeding to the degree of Bachelor of Commerce (General Course) for outstanding merit in the courses of the first and second years. The scholarship will be paid in two equal instalments; the first on registration in the third year and the second on registration in the fourth year. Payment of the second instalment is subject to the student obtaining an average of at least 70% in the courses of the third year.

The Renkenberger Scholarship—See details under Faculty of Arts.

The Institute of Chartered Accountants of Alberta Scholarship of $150.00 will be awarded to a student of outstanding merit entering the third year of the Bachelor of Commerce program in Accounting, based on the work of the first two years.

The Christenson, Morrison and Co. Scholarship of the value of $300.00 is offered annually to a student at the University of Alberta proceeding to the degree of Bachelor of Commerce in Accounting for outstanding merit in the courses of the first and second years. Character and general ability of the student will also be considered. The scholarship will be paid in two equal instalments; the first on registration in the third year and the second on registration in the fourth year. Payment of the second instalment is subject to the student obtaining an average of a least 70% in the courses of the third year.

The Business and Professional Women's Club, Edmonton Branch, Scholarship in Commerce of the value of $100.00 is offered annually to an undergraduate woman student of outstanding merit in the Faculty of Business Administration and Commerce, University of Alberta, Edmonton. The award may be made to a student in any year except her graduation year and shall be based on her performance in the year which she has just completed.

The Lennie M. McNeill Memorial Scholarship of $100.00 provided by the Soroptimist Club of Edmonton is offered annually to an undergraduate woman student of outstanding merit in the Faculty of Business Administration and Commerce, University of Alberta, Edmonton. The award may be made to a student in any year except her graduation year and shall be based on her performance in the year in which the award is made.

The Edmonton Personnel Association Prizes of $25.00 each are offered to three students in the Faculty of Business Administration and Commerce at Edmonton for outstanding merit in Industrial Relations 302, 410 and 420 respectively, provided the students' records are otherwise satisfactory.

The Calgary Personnel Association Prize of $50.00 will be awarded annually to a student in the Faculty of Business Administration and Commerce for outstanding merit in Industrial Relations 302 or 410, provided his record is otherwise satisfactory to the Faculty Council.

The Riddell, Stead, Graham and Hutchison Scholarship of $300 will be awarded annually to a student of outstanding merit entering the final year of the program towards a Bachelor of Commerce in Accounting, who has indicated an intention to proceed into chartered accountancy after graduation. The Faculty will make the selection on a basis of academic record and personal suitability for the profession.

The Touche, Ross, Bailey and Smart Scholarship of $300 will be awarded annually to a student of outstanding merit entering the final year of the program towards a Bachelor of Commerce in Accounting who has indicated an intention to proceed into chartered accountancy after graduation. The Faculty will make the selection on a basis of academic record and personal suitability for the profession.

Hudson's Bay Company Tuition Awards in Commerce. Two awards of the value of tuition and fees for fourth year Commerce are offered by Hudson's Bay Company, Edmonton, to two students who have an interest in a career in merchandising. The basis of award will be high academic standing and promise of executive leadership ability. They will be offered full-time employment during the summer preceding the fourth year.

Apply to the Dean of Commerce by February 15.

THE FACULTY OF DENTISTRY

The Alberta Dental Association Gold Medal is awarded to a student for outstanding merit in the work of the fourth year, provided that the year average is not less than 75%.

The Arthur D. Cumming Gold Medal is awarded annually to a graduating student in Dentistry for outstanding merit in Dentistry for Children, provided that the final year's average is not less than 75%.

The International College of Dentists (Canadian Section) Scholarship in Dentistry, valued at $100.00, is offered annually to a student completing the third year of Dentistry. The basis of award will be outstanding merit in the third year, general character and participation in extracurricular activities.

The Alberta Dental Association Scholarships are three in number of the value of $200.00 each, and will be awarded as follows:

1. One to a student for outstanding merit in all courses of the first year.
2. One to a student for outstanding merit in all courses of the second year.
3. One to a student for outstanding merit in all courses of the third year.

The Alberta Dental Association Prize of the value of $50.00 is awarded to a student of outstanding merit in the work of the second year, provided that the year average is not less than 75%.

The Calgary and District Dental Society Scholarship of the value of $100.00 is offered annually to a student entering third year, who shows outstanding merit in the basic science courses of the first two years of Dentistry, provided that his overall average in Anatomy, Bacteriology, Biochemistry, Physiology and Pathology is 75% or higher.

The Edmonton and District Dental Society Prizes of $100 each are offered as follows: (a) for outstanding merit in the first year, (b) for outstanding merit in the third year, (c) for outstanding merit in Periodontics in the graduating year. In all cases an average of 75% must have been achieved. General character and interest in student activities may be taken into consideration.

The Arthur D. Cumming Scholarships are offered annually as follows:

—$200.00 to a student entering first year Dentistry for outstanding merit in the pre-professional studies at the University of Alberta, provided that an average of 70% has been attained.

—$200.00 to a student of outstanding merit entering the second year of Dentistry.

—$275.00 to a student of outstanding merit entering the third year of Dentistry.

The Alberta Dental Association Scholarship of the value of $300.00 is offered annually to a student of outstanding merit in the pre-professional course at the University of Alberta, provided that the student enters first year Dentistry and that his over-all average is 70% or higher.

The Dean's Scholarship in Dentistry of $300.00, is offered by an anonymous donor to students entering fourth year Dentistry on the basis of financial need and scholarship.

Apply to the Administrator of Student Awards by June 15.

The Dr. R. R. McIntyre Memorial Scholarship of $200, provided by the Calgary and District Dental Society, will be awarded annually to a student completing third year Dentistry for outstanding merit in Interceptive and Preventive Orthodontics providing an academic standing of at least 75% has been attained on the whole year's work.

The College of Dental Surgeons of Saskatchewan Scholarships of the value of $150.00 each are offered annually to two students of outstanding merit entering the fourth year of Dentistry.

The Elizabeth and Wesley Haynes Prize of $50.00 is offered to a student of outstanding merit in the pre-professional studies at the University of Alberta, who has registered in the Faculty of Dentistry.

The Harry Ernest Bulyea Scholarship of the value of $100.00 is awarded by the University of Alberta Dental Alumni Association to the third-year student with the highest average mark in all courses in operative and restorative dentistry.

The Harry Alexander Gilchrist Scholarship of the value of $100.00 is awarded by the University of Alberta Dental Alumni Association to the third-year student with the highest average mark in all courses in prosthetic dentistry.

The Dental Prize for New Canadians of $50.00 is offered by Dr. J. W. Clay to a special student in the Faculty of Dentistry, for general excellence in the first year of study. A candidate for this award must be a recent immigrant to Canada, must have graduated from an overseas dental school and must have been in attendance in the Faculty of Dentistry for at least six months.

The Canadian Dental Association War Memorial Essay Prizes—Two prizes, the first of $200.00 and the second of $100.00, are offered by the Canadian Dental Association as a memorial to Canadian dentists who made the supreme sacrifice in World Wars I and II. The prizes will be awarded for the best essays written by fourth year dental students throughout Canada upon a topic to be announced in September of each year.

This essay is part of the requirements for fourth year students in the University of Alberta.

Further information may be obtained from the Dean of Dentistry or from the Administrator of Students Awards.

The Dental Faculty Class of 1950 Bursary of approximately $200.00 is offered by members of the Dental Class of 1950 to a student of outstanding merit who has completed the second year and is entering the third year in the Faculty of Dentistry at the University of Alberta. The award will be made by the Trustees of the Award Fund on the bases of academic merit and financial need.

The American Academy of Dental Medicine Award, consisting of a five year subscription to the "Journal of Dental Medicine" is made to the graduating student who has displayed the greatest interest in dental medicine during his course.

The American Society of Dentistry for Children Award, consisting of a certificate and a one-year subscription to the American Journal of Dentistry for Children, is awarded to a student of outstanding merit in dentistry for children, in the fourth year.

The Canadian Society of Dentistry for Children Certificate, is awarded on an annual basis to a student of outstanding merit in dentistry for children, in the fourth year.

The C. V. Mosby Book Awards. Four separate awards of books, each to the value of $30.00 will be awarded annually to students of outstanding merit in the Faculty of Dentistry.

The M. H. Garvin Scholarship Fund in Dentistry has been established by the Western Canada Dental Society to encourage and facilitate the studies or research work of undergraduates, or graduates in the most recent graduating class, of the Faculty of Dentistry.

Awards from the fund will be made on the basis of scholastic aptitude and attainment, professional and personal qualification and financial need. The amount of the awards, the frequency with which they are made, and the applicants who are to receive them will be determined by a committee consisting of the President and two vice-presidents of the Western Canada Dental Society.

Applications for grants from this fund should be made to the Dean of Dentistry.

SCHOOL OF DENTAL HYGIENE

The Dental Hygiene Gold Medal and Prize of $50.00 will be provided annually by the Alberta Dental Association to the student graduating with the highest standing from the School of Dental Hygiene.

The C. V. Mosby Book Award—A book award to the value of $30.00 will be awarded to a student of outstanding merit in the first year.

THE FACULTY OF EDUCATION

The Milton Ezra LaZerte Gold Medal and Scholarship. The gold medal is offered by the Alberta Teachers' Association to the student who has shown the highest general proficiency in the final year of the Bachelor of Education program at Edmonton. In addition a scholarship of $500 will be paid to the recipient upon his or her registration for intramural graduate study during a regular session in a university of recognized standing, provided that such study be commenced not later than two years following the award.

The Board of Governors of the University Scholarship of the value of $100.00 is awarded to a student on the basis of the work of the first year in Education provided that an average of not less than 75% be obtained in the work of the year.

The University Scholarship in Education of $300.00 is offered to a student of outstanding merit completing the second year of the Elementary route of the Bachelor of Education program and proceeding in the immediate next session into third year. The student must have attained an average of 75%.

Alberta Teachers' Association Scholarships to Students in Education—Four scholarships, in honor of Honorary Life Members of the Association in the amount of $500 each, are offered annually by The Alberta Teacher's Association to intramural students proceeding from the third to the fourth year of the Bachelor of Education program. The applicants for these scholarships must be bona fide residents of Alberta. Each must have a minimum average of 70 per cent and must give evidence of intention to follow teaching as a career. The scholarships are payable upon registration for intramural study in the fourth year of the Bachelor of Education program, Faculty of Education, University of Alberta, provided that study is continued at the next regular session of the University of Alberta following the award.

Application should be made to the Executive Secretary, Alberta Teachers' Association, Barnett House, Edmonton, not later than May 15.

Alberta Teachers' Association Scholarships to Teachers in the Field—Four scholarships, in honor of Honorary Life Members of the Association, each in the amount of $500, are offered annually by The Alberta Teachers' Association to teachers in the field who, having completed three years of training and holding a permanent Alberta teaching certificate, are proceeding to the fourth year in the Bachelor of Education program. Applicants for these scholarships must be bona fide residents of Alberta, must have a minimum average of 70 per cent, and must give evidence of intention to follow teaching as a career. The scholarships are payable upon registration for intramural study in the fourth year of the Bachelor of Education program, Faculty of Education, University of after the award is made.

Application should be made to the Executive Secretary, Alberta Teachers' Association, Barnett House, Edmonton, not later than May 15.

The Crown Zellerbach Canada Limited Scholarship in Education of $500.00 is offered annually to a Canadian student of outstanding merit who holds an undergraduate degree from the University of Alberta (either Edmonton or Calgary) and who is proceeding in the Faculty of Education towards a Professional Certificate.

Apply to the Administrator of Student Awards by June 15.

The Fuller Brush Company Scholarship in Art—See details under Awards in Departments.

The Lerner Scholarship in Drama—A scholarship of $100.00 is awarded to a student of outstanding merit enrolled in Drama 350 (Advanced Acting). See under Departments.

The Renkenberger Scholarship—See details under the Faculty of Arts.

The Edmonton Jewish Community Council Scholarship, of the value of $100.00, is offered annually to a student of outstanding merit in second year B.Ed. in Edmonton, with options in Household Economics. If no suitable candidate is found in this course, the scholarship will be awarded to a student of outstanding merit in the second year of any B.Ed. program.

The Hazel Robinson Memorial Prize of $100 will be offered annually to a student completing the second year of the B.Ed. program. The award is to be based on work done in English with the emphasis on creative writing.

The Education Society of Edmonton Scholarship of $100.00 is offered annually to a student completing first year of the Bachelor of Education program in Edmonton and proceeding into second year in the succeeding academic session. The basis of award will be academic standing and promise of professional competence.

The Administrative Management Society Scholarship in Business Education of the value of $200.00 will be offered annually by the Edmonton Chapter, A.M.S., to a student of outstanding merit completing the first, second or third year of the B.Ed. program in the Faculty of Education, Edmonton who has been and will continue to be majoring in Business Education and who expresses an intention to pursue a teaching career in Business Education.

The Florence Hallock Memorial Prize of $125, provided by the Edmonton Home Economics Association, will be offered annually to a student of outstanding merit completing the first year and entering the second year of the Faculty of Education with major field in Household Economics.

THE ALBERTA TEACHERS' ASSOCIATION LOANS

The Alberta Teachers' Association has established a fund to provide loans to teachers who hold a permanent Alberta certificate and who are in need of financial assistance to continue their preparation as teachers through intramural study. Applications will normally be considered during the months of May and September. Those to be dealt with in May must be received by May 15 and those to be dealt with in September must be recieved not later than August 31. Loans are not available for summer session. Priority will be given to applications received in May which demonstrate the greatest need for assistance.

The maximum loan obtainable is $800 at the interest rate of 3%. Inquiries and applications should be addressed to the Executive Secretary, The Alberta Teachers' Association, Barnett House, Edmonton.

LOCAL SCHOOL BOARD ASSISTANCE

Some local School Boards provide grants or loans to students in teacher education program. Students should inquire of any School Board in which they might be interested.

THE FACULTY OF ENGINEERING

The Henry Birks and Sons, Limited, Gold Medal is offered annually to a graduating student from the Faculty of Engineering on a basis of academic standing in the final two years (not less than 75%) and qualities of leadership and character.

The Association of Professional Engineers of Alberta Gold Medals are offered to one graduating student in each of the departments of chemical, civil, electrical, mechanical, metallurgical and mining engineering on the basis of individual talent, applicant and diligent study. For the purposes of this award the academic record of the third and fourth years is combined and a general average of at least 75% must be attained. The right is reserved to withhold the awarding of one or all of these medals if, in the opinion of the Faculty of Engineering, candidates do not show sufficient merit.

The Society of Chemical Industry Merit Awards. Three awards will be made annually consisting of a gold key bearing the crest of the Society and a year's subscription to "Chemistry and Industry". The awards will be made to the student graduating with the highest standing in each of Honors Chemistry, Honors Biochemistry and Chemical Engineering, provided an average of 75% is attained in the final year and that the course has been completed in the normal number of years.

(The following awards are listed alphabetically)—

The Alberta Phoenix Tube and Pipe Limited Scholarships in Metallurgy of $500 each will be offered annually to two students of outstanding merit entering third or fourth years in Metallurgical Engineering.

The Aluminum Company of Canada, Limited, Scholarship. See details under Faculty of Science.

American Society for Testing Materials Prize Awards—Four prizes each consisting of a year's membership in the Society, a certificate, eight issues of the A.S.T.M. Bulletin and two books from a selected list on standards and materials, are offered annually to students in engineering on the basis of demonstrated ability and interest in the field of materials.

Prize winners are selected on the basis of their performance in courses in materials: Met.E. 252, Ch.E. 252, Met.E. 361 and C.E. 455; or on the basis of a summer report on a topic related to materials.

R. Angus Alberta Limited Scholarship in Highway Engineering of $500.00 to be awarded annually to a student of outstanding merit entering fourth year

Civil Engineering and registered in the elective courses in Highway Engineering. To qualify, the student must have taken a complete third year program in Civil Engineering at the University of Alberta and have attained an average of at least 75%.

Apply to Administrator of Student Awards by June 15.

The Association of Professional Engineers of Alberta H. R. Webb Memorial Scholarship of the value of tuition and fees is offered annually by the Association in memory of Professor Harry Randall Webb, formerly Registrar of the Association, to a student of outstanding merit completing the first and entering the second year of the Faculty of Engineering in Edmonton.

The Board of Governors of the University Scholarship of the value of $100.00 is awarded annually to a student of outstanding merit entering the second year of Engineering, provided that an average of not less than 75% has been obtained on the work of the first year.

The British America Paint Company Scholarship in Engineering of $250 is awarded annually to a student of outstanding merit entering the second year of the Faculty of Engineering. The award will be based on the work of the first year.

The Chevron Standard Limited Scholarship in Engineering of $400 is offered annually to a student of outstanding merit who is entering the final year of Chemical, Mechanical or Mining Engineering and who is interested in oil exploration or production. Preference will be given to a male Canadian citizen.

Apply to Administrator of Student Awards by June 15.

The Canada Cement Company Scholarships—Two scholarships, each of the value of $500.00 are offered annually to students of outstanding merit, one entering third year Civil Engineering and one entering third year Mechanical Engineering, at the University of Alberta, to be based on the work of the second year. To qualify a student must have completed a second year program of normal weight at the University of Alberta and have attained an average of at least 75.%.

In the event that no student qualifies for one of the above, the award would be made available in the other department as a second award for that year.

The Canadian Construction Association Essay Prize of $50.00 and an Engineer's Handbook will be awarded annually for the best essay on a subject related to construction, by a student in the final year of the Faculty of Engineering. Essays may be those requisite to the student's program or written specially. Selection will be made by the Faculty and the winning essay will then be eligible for a prize of $100.00 on a Canada wide basis.

Essays to be submitted to the office of the Dean by April 15.

The Cardium Supply Ltd. Scholarship of $400 is offered annually to a student of outstanding merit entering the fourth year of Chemical or Mechanical Engineering. Preference is to be given to students enrolled in the Petroleum Engineering options.

The Chemical Institute of Canada Prize in Chemical Engineering of the value of $25.00 in books is awarded annually to the student in Chemical Engineering who obtains the highest standing in the work of the third year, provided that the student's general record is satisfactory to the Faculty Council.

The Con-Force Products Ltd. Scholarship in Civil Engineering of the value of $400 is offered to a student of outstanding merit entering the third year of Civil Engineering. The award will be based on the work of the second year at the University of Alberta.

The A. Cristall Memorial Scholarship of $100, provided by the Royal George Hotel, Edmonton, will be awarded annually to a student of outstanding merit in Drafting 151 in the Faculty of Engineering at Edmonton, provided the student passes all courses in a full program and with an average of at least 75%.

The Cyanamid of Canada Limited Scholarship of $600 will be awarded (for 1966-67 and 1967-68) to a student of outstanding merit entering the fourth year of the Department of Chemical Engineering. A grant-in-aid of $300 will be provided to the Department.

The Double A Drilling (Western) Ltd. Scholarship of $500 will be awarded annually to a student of outstanding merit completing third year and entering fourth year Mechanical Engineering at the University of Alberta providing an average of at least 75% has been attained.

The Dow Chemical Scholarship in Chemical Engineering, consisting of a scholarship of $500 to the student selected and a grant of $250 to the Department of Chemical and Petroleum Engineering, is offered annually by Dow Chemical of Canada Limited to a student of outstanding merit on the basis of his academic record in the third year of Chemical Engineering and his interest in the Chemical Engineering Club of the University of Alberta and in student affairs generally. The Scholarship is tenable at the University of Alberta in the fourth year of Chemical Engineering.

Engineering Institute of Canada Prize for Third-Year Students in Engineering—The Engineering Institute of Canada offers a prize of $25.00, open for competition to university students in Engineering following all of the prescribed courses in chemical, civil, electrical, mining, or mechanical engineering.

To be eligible a student must be a member of, and active in, such a students' engineering organization of the University as the Engineering Students' Society, the Mining and Geological Society, the Chemistry Club, the Students' Branches of the Institute of Electrical and Electronic Engineers or the Engineering Institute of Canada.

The recommendations for award shall be made, after the final examinations of the year, by a committee to be appointed by the Dean of Engineering at a faculty meeting in the session.

The bases of award shall be: (a) the average mark for the courses assigned to that year, this in no case to be less than 75%, and (b) the value of services rendered to a students' engineering organization of the University.

The Gas Company Undergraduate Scholarships in Engineering of $500 each are offered annually by Northwestern Utilities Limited to two students on the

basis of academic achievement in the second year of the Engineering program. These scholarships are tenable in the third year of the Engineering program at the University of Alberta.

The Sam J. Gorman Memorial Bursary in Engineering of the value of $300.00 is offered by his executors to a student who has completed the second year of any branch of Engineering at the University of Alberta. The award will be based upon high scholastic standing in the work of the year just completed and upon evidence of financial need.

Apply to the Administrator of Student Awards by June 15.

The Albert J. Hrapko Memorial Prize of $100 is offered annually by members of his family in memory of Mr. Hrapko who graduated from the University of Alberta in 1951 and who died in 1964, to a student of outstanding merit entering the Electronic pattern of 4th year in the Department of Electrical Engineering.

The Inland Cement Company Scholarship of the value of $600 is offered annually to a student of outstanding merit entering the fourth year of Civil Engineering. The award is based on the work of the third year. To qualify, a student must have completed a third year program of normal weight at the University of Alberta and have attained an average of at least 75%.

The Johnston Testers Limited Scholarship of the value of $500 is offered to a student of outstanding merit entering the third year of Chemical or Mechanical Engineering who intends to elect the undergraduate courses in Reservoir Mechanics as part of his fourth year program. The award will be based on the work in the second year of Engineering at the University of Alberta.

Apply to Administrator of Student Awards by June 15.

The Douglas Farquhar Johnston Bursaries in Engineering of the value of $500.00 each are offered annually to two students entering the fourth year of a program in Mining Engineering or Metallurgical Engineering. The awards will be based on academic standing and financial need.

Apply to the Administrator of Student Awards by June 15.

The John Alexander McDougall Memorial Scholarship in Civil Engineering of $500 is offered annually to a student of outstanding merit entering the fourth year of Civil Engineering based on the work of the third year.

The Northern Electric Undergraduate Scholarship which provides an amount not exceeding $500 to cover tuition and general fees and the cost of books for one year, is awarded annually to a student of outstanding merit who is proceeding into the second, third or fourth year of Electrical Engineering or Honors Physics. The applicant must be a Canadian citizen or a landed immigrant and must normally have secured an average of at least 75% in the work of the preceding university year. Students who have held the scholarship previously are free to apply for renewal of the award.

Apply to the Administrator of Student Awards by June 15.

The Nowsco of Canada, Ltd., Scholarship of $500 will be awarded to a student of outstanding merit entering the third year in the Faculty of Engineering at the University of Alberta, Edmonton.

The Jessie E. Paull Memorial Prize of the value of $50.00 is awarded annually to the student obtaining the highest standing in C.E. 410 (Highway Engineering) in the fourth year of civil engineering, provided the student obtains an average of a least 75% in this subject and is registered in a full year's program.

The Prize in Eng. P. 459 of $50 will be awarded each year to a graduating student in Engineering. The award will be based on the performance of the student in the assignments associated with the course of Eng. P. 459, "The Practice of the Engineering Profession", provided the student has obtained an overall average of not less than 70% in the full final year.

The R. C. E. Memorial Scholarship—The Royal Canadian Engineer Memorial Trust offers annually a scholarship of $125.00 to a student who has completed his third year in Engineering. Applicants must be members in good standing of the Officers' Training Corps (Army) and have had at least one summer's training with such unit. Award will be made on the basis of academic standing and qualities of leadership manifested in the activities of the Officers' Training Corps and in student affairs generallly.

Apply through the Administrator of Student Awards by May 15.

The Schlumberger of Canada Scholarship of $500 is offered to a student of outstanding academic merit entering the fourth year of Electrical Engineering at the University of Alberta based on the work of the third year. A grant-in-aid of $500 is also provided to the University. This scholarship is offered for the academic years of 1965-66 and 1966-67.

The J. M. Sharpe Memorial Prize of $100, provided in his memory by Electrical Equipment (Alberta) Ltd., will be awarded to the student obtaining the highest standing in the Electrical Engineering subjects, E.E. 330, E.E. 350 and E.E. 370 in the third year of the Electrical Engineering program provided that the student obtains an overall average of at least 75% in these subjects and that he is registered in a program of normal weight.

The Sherritt Gordon Mines Limited Scholarship in Chemical Engineering of $600 will be awarded annually to a student of outstanding merit entering fourth year Chemical Engineering.

The Sunwapta Broadcasting Company Scholarship of $200.00 for students entering fourth year Electrical Engineering interested in the field of communications, as related to the Broadcasting and Television industry.

Apply to Administrator of Student Awards before June 15. (See further details under Faculty of Arts.

Underwood McLellan and Associates Limited Scholarship in Municipal Engineering of $200 is awarded annually to a student of outstanding merit entering fourth year Civil Engineering, preferably in the Municipal Engineering option. To qualify, the student must have taken a complete third year program in Civil Engineering at the University of Alberta and have attained an average of at least 70%.

Apply to the Administrator of Student Awards by June 15.

Webb Memorial Student Paper Competition—Each year the Engineering Students' Society at Edmonton awards three prizes of $50.00, $30.00 and $20.00

for the three best student papers written and presented to the Society at its regular meetings. To be eligible, a student must be a member of the Engineering Students' Society in Edmonton. The rules of the competition are set forth in the Society's constitution.

Western Supplies Limited Scholarship of $500 per year will be offered annually to a student of outstanding merit completing the first year of the Faculty of Engineering at Edmonton, whose home is in that portion of Alberta north of and including the City of Red Deer. The award is tenable for the second, third and fourth years provided an academic average of at least 70% is achieved in each year.

The John Wilcox Memorical Prize of the value of $100.00 provided by the Petroleum Engineering Class of '53, will be awarded annually to a student of outstanding merit, completing 3rd year of Chemical Engineering. General ability and financial need will be considered as well as academic standing.

THE SCHOOL OF HOUSEHOLD ECONOMICS

The Warren W. and Ida E. Prevey Memorial Gold Medal in Household Economics is offered by Dr. Esther and Miss Ruth Prevey in memory of their parents to the graduating student making the highest standing in the work of the last two years of the course leading to the degree of B.Sc. in Household Economics, provided such student's standing is deemed satisfactory to the School of Household Economics.

The Russell Food Equipment Limited Scholarship of $350.00 is offered annually to a suitably qualified student graduating from the School of Household Economics of the University of Alberta who is proceeding, either at this or any other approved university, in an M.Sc. program in Foods, Nutrition, or Institution Management, or proceeding into a Dietetic Internship at an approved institution. The scholarship will be payable after registration in the selected program.

The Lorena Barfoot Prize of $50.00 is offered annually to a suitably qualified student graduating from the School of Household Economics of the University of Alberta and who is proceeding into a Dietetic Internship at an approved institution. The prize will be payable when the student has begun the Internship.

The Clothing and Textile Scholarship of $200 will be awarded annually to a student of outstanding merit entering the third year of the Clothing and Textile program in Household Economics. The student must have passed all subjects and obtained an average of at least 70% on the work of the first two years.

The Mabel Patrick Scholarship of $200.00, provided by the Alberta Home Economics Association, is offered annually to a student of outstanding merit based on the work of the first and second years in Household Economics, provided that the student obtains an average of at least 70% and passes in all courses.

The Hazel McIntyre Prize of $125, provided by the Edmonton Home Economics Association, will be offered annually to a student of outstanding

merit entering the third year of the School of Household Economics in the Foods pattern, based on the results of the first two years.

The Annie Gertrude Tory Scholarship of the value of $100.00 endowed to her memory by her husband, the late Henry Marshall Tory, first President of the University, is offered annually to the student in Household Economics who takes the highest standing in the work of the second year. The student must pass all courses and obtain an average of not less than 70% on the work of the year.

The Gretta Shaw Simpson Memorial Prize of the value of $25.00 is offered annually by Miss Maimie S. Simpson in memory of her sister, formerly instructor in Bacteriology in this University. It is to be awarded to the student in Household Economics who takes the second highest standing in the work of the second year, provided that the student passes all courses and obtains an average of not less than 70%.

The Phylis Osborne McGachie Bursary in Household Economics of the value of $100.00 is available to a student completing the first or second year of the B.Sc. course in Household Economics. The ward will be made on the basis of academic record, which must not fall below second class, and of financial need. Applications should reach the Administrator of Student Awards by June 15.

The Alberta Wheat Pool Scholarships—See under Matriculation Scholarships.

THE FACULTY OF LAW

The Horace Harvey Gold Medal, established by the late Chief Justice of Alberta, is offered for the highest standing in the work prescribed for the LL.B. degree, provided that the student obtains an average of not less than 75%.

The George Bligh O'Connor Silver Medal in Law is offered in memory of the late Honorable G. B. O'Connor, Chief Justice of Alberta, for the second highest standing in the work prescribed for the LL.B. degree, provided that the student obtains an average of not less than 75%.

The Ernest Brown Wilson Memorial Prize in Law of $100.00 will be awarded annually to a student in the graduating class in Law. The award will be based on outstanding merit in the work prescribed for the third year of the LL.B. degree.

The Gilbert M. Blackstock Scholarship of $250 in memory of the late Mr. Blackstock will be awarded for outstanding merit in the work prescribed for the first year of law. Need as well as academic standing may be taken into consideration. (The award will be offered for four years beginning 1964-65.)

The Macleod, Dixon and Company Scholarship of the value of tuition and fees will be offered annually to a student of outstanding merit entering the third year of the Faculty of Law.

The Board of Governors of the University Scholarship of the value of $100.00 is awarded on the basis of the work of the first year in the Faculty of Law, provided that an average of not less than 75% be obtained in the work of the year.

The Second Counsel Club Prize of $100 is offered annually to the woman student in first year Law who has the highest average in the work of first year provided that her work is of outstanding merit. In the event that no woman is eligible the Prize shall go to the male student who has the second highest average in the work of the first year provided that his work is of outstanding merit.

The President's Scholarship—See under the Faculty of Arts.

The Abe W. Miller Memorial Prize in Criminal Law of $100 has been provided by the law partners of the late Abe W. Miller, Q.C. The Prize will be awarded annually to a student completing first year Law for outstanding performance in the subject of Criminal Law.

The Honorable Clinton J. Ford Shields will be presented annually in memory of The Honorable Clinton J. Ford, formerly Chief Justice of Alberta, to each of the two third-year students who make the best argument in the finals of the annual Moot Court Competition. In addition the names of each year's winners will be recorded on a permanent plaque, a gift of the late Chief Justice.

The four finalists are selected from those students who have presented the best arguments in the second-year Moot program. The four will compete in two teams, the winning team to receive the shields.

The Edmonton Lodge of B'nai B'rith Prize of $50.00 is offered to such student in the second year of Law as may be selected by the Faculty of Law.

The Raymond James Memorial Prize of $50.00 endowed by Mrs. E. L. FitzSimon, LL.B. 1926, in memory of her brother, to be awarded to a student in the final year in Law for outstanding merit in the subject of Equity.

The Insurance Company of North America — H. C. Mills Memorial Award of $250 will be awarded annually to the student in the Faculty of Law at the University of Alberta who obtains the highest standing in Insurance Law.

The National Trust Prize—A prize of books of the value of $30.00 is offered by the National Trust Company to a student of the graduating class in Law for outstanding merit in the examinations in Equity 1, Equity 2, Real Property 2, Real Property 3, and Wills and Administration, provided an average of at least 75% is attained on complete second and third years.

The Sydney B. Woods Memorial Prize in Constitutional Law—A prize of value of $50.00 has been provided by S. W. Field, Q.C. and L. D. Hyndman, Q.C., former partners of the late Sydney B. Woods, K.C. The prize is awarded annually to a student in Law for outstanding merit in the subjects of Constitutional Law. The award is conditional upon the student's reaching a standard which is deemed satisfactory to the Faculty Council.

The Morris and Naomi Schoctor Memorial Prize in Law of $50.00 is awarded to a student at the end of the third year of Law, who has maintained a satisfactory academic record and who has made a significant contribution to student life in the University.

The William Gordon Egbert Prize in Administrative Law of the value of $50.00 is awarded annually for outstanding merit in Administrative Law.

The Canada Permanent Trust Company Prize in Wills, of the value of $100.00, is offered annually to a student in the Faculty of Law for outstanding merit in the subject of Wills, provided the student's general record is satisfactory to The Faculty Council.

The Canada Law Book Company Prize in Law is awarded for outstanding merit in the work prescribed for first year of Law. The Prize consists of books to the value of $75.00 to be selected from a list submitted by the Canada Law Book Company and the selection shall be made within six months of the awarding of the prize.

The Carswell Prizes in Law. Three prizes of the value of $30.00 in books each are offered by the Carswell Company, Limited, Law Publishers, to three students for outstanding merit in the work of the first, second and third years respectively.

The books shall be selected by the student from a list submitted by the Carswell Company, and the selection shall be made within six months of the awarding of the prize.

THE FACULTY OF MEDICINE

General

The Moshier Memorial Gold Medal is offered by the Volunteer Overseas Medical Officers' Association of Edmonton in memory of the late Lieutenant-Colonel H. H. Moshier, M.B., to a graduating student for outstanding merit in all studies in the Faculty of Medicine, provided that the over-all average mark of the student is 75% or more.

The John W. Scott Honor Award, consisting of a medal and a cash prize of $250.00, is offered by the Medical Alumni Association of the University of Alberta to a student completing the final year of the M.D. program who, over the four years of the course, has shown himself to possess to an outstanding degree those qualities of scholarship, leadership and character which may be expected to lead to a distinguished position in the medical profession. The recipient will be selected by a committee on which faculty, students and alumni will be represented.

The award may be made to more than one student in any one year, and may be withheld in the event that no sufficiently deserving candidate is available.

Research Fellowship of College of Physicians and Surgeons of Alberta— The Council of the College of Physicians and Surgeons of Alberta has established a research fellowship for undergraduates in the Faculty of Medicine under the following conditions:

1. The amount of the fellowship shall be $1,800, plus general and instruction fees for the next succeeding year in medicine, provided the holder returns to this Faculty.
2. It shall be granted at the completion of the first or second year in Medicine.
3. This fellowship shall be tenable for one year, but may be renewed for a further period.
4. The research shall be carried out in one of the basic sciences.

5. It shall only be granted when in the opinion of the Medical Faculty they have a student who from the standpoint of ability and aptitude is worthy of this scholarship.
6. From time to time the Council shall be advised of the nature of the work being carried out and its progress.

In the event that no suitable person is available in any one year the award may be made to two senior medical students as two undergraduate medical research summer scholarships in the amount of $1,000 each.

Apply to Dean of Medicine by March 1.

The Scholarships of the College of Physicians and Surgeons of the Province of Alberta. Six awards of $200.00 each will be awarded as follows:

1. One scholarship shall be awarded to that student of each of the first three years of Medicine who attains the highest average mark in his class.
2. One scholarship shall be awarded to that student of each of the first three years of Medicine who attains the second highest average mark in his class.

Each of these awards is contingent upon the student's proceeding with his University course during the year following the award.

The Mrs. J. W. S. Chappelle Bursary of $200 provided by Mrs. Chappelle will be offered annually to a student entering second year Faculty of Medicine on a basis of academic standing and financial need.

Apply to Administrator of Student Awards by June 15.

The Dr. Allan Coates Rankin Award, of the value of $100.00, will be awarded annually to the most deserving and outstanding student completing any year of the Faculty of Medicine. The selection will be made by the Faculty on a basis of academic standing in that year and of financial need.

The Alberta Tuberculosis Association Prize of $100.00 is offered annually to a third or fourth year medical student for the most satisfactory essay, submitted in duplicate, on some phase of thoracic disease. The prize also includes a one-year subscription to the American Review of Respiratory Diseases.

Essays to be submitted to the Administrator of Student Awards by March 1.

The Kenneth William Moodie Scholarship—As a memorial to her nephew, Flying Officer Kenneth William Moodie, a graduate in science of the University of Alberta who lost his life in May, 1942 while on operations, the late Miss Marion E. Moodie made provision in her will for an annual scholarship of $200.00 to a student of outstanding merit entering the first year of the Faculty of Medicine or the third year of the B.Sc. program in the Faculty of Science in Edmonton. The basis of award will be academic attainment on the previous year's standing at the University of Alberta, financial need and evidence of satisfactory personal qualities.

Apply to the Administrator of Student Awards by June 15.

The Vessie Heckbert Memorial—$2,500 will be offered annually to either an undergraduate or a graduate in the Faculty of Medicine at the University of Alberta for one year of research in the field of cancer treatment. In the event that no suitable person is available in any one year, the award may be made to

two senior medical students as research workers during the summer. in the amounts of $1,000 each plus $250 each for research materials.

Apply to the Dean of Medicine by March 1.

The C. V. Mosby Book Awards. Five separate awards of books, each to the value of $30.00, will be awarded annually to students of outstanding merit in the Faculty of Medicine.

The H. E. Rawlinson Medical Book Awards will be offered annually by Lange Medical Publications of California to two graduating students from the Faculty of Medicine, for general excellence. Each award will consist of the student's choice from their list of publications.

Bacteriology

The Allan Coates Rankin Prize in Bacteriology of $25 is given by the Rankin Medical Journal Reporting Club to the medical student who obtains the highest mark in Bacteriology 421, provided that he has obtained at least a 75% mark in this course and that he has taken, and has passed, all of the subjects of that year.

Biochemistry

The Hugh and Mabel McAfee Memorial Scholarship of $250.00 is offered annually to a student of outstanding merit in Biochemistry in the first year of the Faculty of Medicine, provided the student's record is otherwise satisfactory.

Medicine

The E. L. Pope Memorial Award in Medicine consisting of $75 and a scroll is offered annually by the Edmonton Academy of Medicine to a graduating student for outstanding merit in Medicine, providing that the over-all average mark in the courses in Medicine is 75% or more.

The Percy H. Sprague Prize in Medicine consisting of $75 and a scroll is offered annually by the Alberta Society of Specialists in Internal Medicine to a student of outstanding merit in Internal Medicine completing the third year of the Faculty of Medicine.

The Prizes of the Associated Hospitals of Alberta in Medicine and Surgery of the value of $50 each are offered by the Associated Hospitals of Alberta to two third year students of outstanding merit in the work of Medicine and Surgery respectively in second and third years.

Obstetrics and Gynaecology

The Conn Memorial Gold Medal is offered annually through the generosity of Mr. G. H. Wood to a graduating student for outstanding merit in Obstetrics and Gynaecology, providing that the over-all average mark of the student in the courses in these subjects is 75% or more.

Ophthalmology

The Dr. Ernest A. Johnson Scholarship in Ophthalmology of $100 will be awarded annually to a student of outstanding merit graduating from the Faculty of Medicine, based on the results of the examinations in Ophthalmology in the third or fourth years.

Paediatrics

The Douglas Leitch Gold Medal in Paediatrics, provided by the Alberta Paediatrics Society, will be awarded annually to a graduating student from the Faculty of Medicine for outstanding merit in Paediatrics.

Pathology

The John James Ower Memorial Gold Medal in Pathology, provided by the Medical Alumni together with friends and colleagues of Dr. Ower, will be awarded annually to a graduating student in the Faculty of Medicine for outstanding merit in Pathology, provided that an average of 75% has been attained in the courses in Pathology.

The John James Ower Memorial Scholarship in Pathology of $250, endowed by the Medical Alumni together with friends and colleagues of Dr. Ower, will be awarded annually to a student completing the 3rd year of the Faculty of Medicine for outstanding merit in Pathology. A student must have attained at least 75% in the course in Pathology in each of the 2nd and 3rd years to be eligible.

The Isaac and Leah Weinlos Prize in Pathology of $50, provided by Dr. Morris Weinlos and family, will be awarded annually to a student in third year Medicine for outstanding merit in Pathology.

Pharmacology

The Nathan Browne Eddy Prize in Pharmacology is offered by Hoffmann-La Roche Limited to a student who has successfully completed the second year of Medicine with an average standing of at least 75% and has shown outstanding merit in the course in Pharmacology. The prize is an instrument useful in Medical practice or books to the value of about $40.00.

Physiology

The A. W. Downs Prize in Physiology endowed jointly by Dr. W. J. Downs and the Medical Alumni Association, will be awarded annually to the medical student who obtains the highest mark in the course in physiology in the first year provided he has obtained at least a 75% mark and has pass in all subjects. The prize is an instrument useful in medical practice of a value of about $50.00.

Psychiatry

The Dr. S. S. Spaner Prize in Psychiatry, of the value of $50.00, will be awarded annually to a student of outstanding merit in Psychiatry who is completing the final year, provided the student's record is otherwise satisfactory.

Surgery

The Mewburn Memorial Gold Medal in Surgery is offered annually by the Medical Undergraduate Society of the University of Alberta to a graduating student for outstanding merit in surgery, providing that the over-all average mark of the student in courses in Surgery is 75% or more.

The Isaac and Leah Weinlos Prize in Surgery of $200, provided by Dr. Morris Weinlos and family, will be awarded annually to the student with the highest combined standing in third and fourth years Surgery provided the student's record is otherwise satisfactory.

The Prizes of the Associated Hospitals of Alberta in Medicine and Surgery —see under Medicine above.

The Surgical Research Prize of $50.00 will be awarded to a third or fourth year student in the Faculty of Medicine for the best manuscripts submitted on an original Surgical Research topic. Suggested general divisions for the topics are Pure Experimental Surgical Research or Clinical Surgical Research. Although importance will be attached to an original approach to an unsolved problem, other topics will be considered. Manuscripts are to be neatly typewritten, double spaced and are not to exceed twenty-five full pages. Figures, charts and an adequate bibliography will be expected. For details regarding the manuscript applicants may contact the members of the Department of Surgery. Manuscripts must be submitted to the Dean of Medicine by March 31 of each year.

MEDICAL LABORATORY SCIENCE

The Associated Hospitals of Alberta Gold Medal and a prize of $25.00 will be given to the student graduating with the highest distinction from the B.Sc. program in Medical Laboratory Science.

The Associated Hospitals of Alberta Prize in M.L.S. of $50.00 is offered annually to a student of outstanding merit completing the third year of the Medical Laboratory Science program.

The Alberta Society of Pathologists Prize in M.L.S. of $25.00 is offered annually to a student of outstanding merit completing the second year of the Medical Laboratory Science program.

THE SCHOOL OF NURSING

The President's Gold Medal in Nursing and the Prize of the Chairman of the University Hospital Board are awarded to a graduating student for outstanding merit in the theory and practice of nursing.

The Margaret Cogswell Memorial Scholarship of $250 is awarded annually to a member of the Alberta Association of Registered Nurses, a resident of the province and a graduate of a school of nursing in Alberta, who is proceeding to further full time study in Nursing Education at the University of Alberta. The award will be based on previous academic record and professional competence.

THE FACULTY OF PHARMACY

The Alberta Pharmaceutical Association Medals. A gold medal plus full cost of registration in the Association is offered for outstanding merit in all subjects of the fourth year of the Faculty of Pharmacy provided that at least 60% is attained in each subject and an average of at least 75%.

A silver medal plus one half the cost of registration in the Association is offered on similar terms to a student completing the three-year degree program.

The Film Services (Alberta) Limited Scholarship of $500 is offered annually to a student of outstanding merit entering fourth year Pharmacy preferably in the Pharmacy Administration program.

The Alberta Pharmaceutical Association Awards are offered as follows:

1. A scholarship of $100.00 for outstanding merit in all subjects of the first year, provided that the mark obtained in any subject does not fall below 60%.
2. A scholarship of $100.00 for outstanding merit in all subjects of the second year, provided that the mark obtained in any subject does not fall below 60%.
3. A book prize consisting of a five-year subscription to The Practical Pharmacy Edition of the Journal of the American Pharmaceutical Association for outstanding merit in the dispensing course in the second year.
4. A prize consisting of registration with the Alberta Pharmaceutical Association, for the student preparing the best thesis in the Pharmacy 449 laboratory course provided the record of the student is otherwise acceptable.

The M. J. Warner Scholarship of the value of $100.00 is offered annually by the Alberta Pharmaceutical Association in memory of the late M. J. Warner for outstanding merit in the pharmacy course of the first and second years, provided that the mark in any pharmacy subjects does not fall below 65%, that the average obtained in all subjects is not less than 75% and that the student's record is otherwise satisfactory to the Faculty of Pharmacy.

The Upjohn Company of Canada Scholarship of $200 is offered annually to a student of outstanding merit entering the fourth year of the Faculty of Pharmacy.

The Shipley Scholarship of the value of $250.00 is offered by Shipley Photo Service Limited to a student of outstanding merit completing the second year course in dispensing pharmacy.

The Drug Travellers of Alberta Bursary of the value of $300.00 is offered jointly by the Alberta Range Riders, Calgary, and the Northern Ambassadors, Edmonton (Alberta drug travelling fraternities), to a student of outstanding merit who has completed at least one academic year in the Faculty of Pharmacy. The basis of this award is scholarship, leadership, financial need and aptitude in the field of Pharmacy.

The Southern Alberta Pharmacy Bursary of $250.00 is offered annually by the South of Calgary Pharmacists and the Highwaymen (Southern Alberta Drug Travellers) to a student of outstanding ability completing the first year of the Faculty of Pharmacy. The student must have taken the majority of his high school training in Alberta, south of but not including Calgary. Financial need will be considered in making the award.

The Edmonton and District Ladies' Pharmaceutical Auxiliary Scholarship of $100 is offered annually to a student of outstanding merit entering the third or fourth year of the Faculty of Pharmacy.

The Calgary Ladies Pharmaceutical Auxiliary Prize is offered annually to a woman student of outstanding merit in the pharmacy courses of the first year, provided that her combined average in these courses is not less than 75%, and that her record in the other courses is satisfactory to the Faculty of Pharmacy. If no qualified woman student is available the award may be made to a man. The amount of the ward will be determined each year but it is expected to be $100.00.

The Canadian Foundation for the Advancement of Pharmacy Scholarships, valued at $100.00 are offered to undergraduates. The number of such scholarships will be determined from year to year. One award will be available to a student completing the first year of the course, and one to a student completing the second year.

The minimum requirements are a general average of 75% for the previous term's work, provided the standing in the practical work in Pharmacy does not fall below 75%. Financial need will be considered in making the award.

The Charles E. Frosst Scholarship of the value of $250.00 is offered annually by Charles E. Frosst and Company of Montreal to a student of outstanding merit entering the final year of the Faculty of Pharmacy.

The Charles Cummer Memorial Prize of the value of $100.00 is offered to a student of outstanding merit entering the second or third year of the pharmacy course. Financial need will be considered in making the award.

The W. W. Maday Scholarship of the value of $100 is offered annually for three years (1965-66, 66-67, 67-68) by Walter W. Maday to a student of outstanding merit entering the fourth year of the Faculty of Pharmacy in the Hospital Pharmacy program.

The Burroughs Wellcome Bursary of the value of $250.00 is offered by Burroughs Wellcome and Company (Canada) Limited to a student entering the second or third year of the pharmacy course who has demonstrated outstanding ability in the field of pharmacy. Financial need will be considered in making the award.

The Merck, Sharp and Dohme Awards. Two awards each consisting of $25 cash and certain pharmaceutical manuals are offered by Merck, Sharp and Dohme of Canada Limited to the two students in first year Pharmacy who attain the highest standing in Chemistry 230 and Chemistry 250 respectively.

The Canadian Pharmaceutical Association Prize consisting of a copy of The Compendium of Pharmaceutical Specialities (Canada) is offered to a student of outstanding merit in the Pharmacy 432 course.

THE FACULTY OF PHYSICAL EDUCATION

The Alumni Gold Medal in Physical Education is offered by the Alumni Association of the University of Alberta to the outstanding graduating student in Physical Education, provided the student has been registered in a full year's program and has obtained an average of at least 75% in the final year.

The J. K. Campbell and Associates Limited Scholarship of $200.00 will be awarded annually to a student of outstanding academic merit completing the second year in the Faculty of Physical Education.

The Atomic Transfer Ltd. Bursary of $200 will be offered annually to a student completing first year of the Faculty of Physical Education, on a basis of academic standing and financial need.

The Edmonton Women's Branch of the Canadian Association for Health, Physical Education and Recreation Book Prizes of $50.00 each are offered to two woman students of outstanding merit one completing the first year and one completing the second year of the Bachelor of Physical Education program in Edmonton.

The Edmonton Men's Branch of the Canadian Association for Health, Physical Education and Recreation Bursaries.

1. Three bursaries of $100 each to students entering second or third year of the B.P.E. program (not more than one of whom may be a woman).
2. One bursary of $100 to a student (man or woman) entering second, third or fourth year of the B.A. in Recreation Administration program.

The awards will be based on academic standing (not less than 65%), financial need and contribution in the field of Physical Education or Recreation.

Recreation Scholarships—see under Province of Alberta Assistance.

THE SCHOOL OF REHABILITATION MEDICINE

The Physiotherapy Book Prize is offered by the Canadian Physiotherapy Association to the student obtaining the highest standing in the final year of the diploma course in Physical Therapy at the University of Alberta, providing that his or her record is otherwise satisfactory to the Council of the School.

The Occupational Therapy Book Prize will be offered annually by the Alberta Society of Occupational Therapists to the student obtaining the highest standing in the final year of the Diploma program in Occupational Therapy, providing that his or her record is otherwise satisfactory to the Council of the School.

The Calgary Branch Canadian Physiotherapy Association Book Prize will be awarded to an outstanding student graduating with the Diploma in Physical Therapy, on a basis of academic standing, practical work and general personality.

The Canadian Arthritis and Rheumatism Society (Alberta Division) Bursary of $1,000 will be offered annually to a student entering third year of the School of Rehabilitation Medicine, based on academic standing and financial need.

Apply to Administrator of Student Awards by June 15.

The Canadian Arthritis and Rheumatism Society (Alberta Division) Prize of $50 will be offered annually to a student entering second or third year of the School of Rehabilitation Medicine showing an outstanding aptitude in some phase of training in Physiotherapy.

The Canadian Arthritis and Rheumatism Society (B.C. Division) Prize of $50.00 will be awarded annually to a student of outstanding merit completing the second year of the School of Rehabilitation Medicine at the University of Alberta.

The Canadian Foundation for Poliomyelitis and Rehabilitation (Alberta Chapter) Bursaries of $350.00 are offered to students in the Diploma program in Rehabilitation Medicine. The Foundation is sponsored by the Royal Canadian Legion. Three bursaries will be awarded each year, preferably one at each of the levels of entering first, second and third years. The basis of award will be academic standing and financial need. It is expected that recipients will carry on their profession in Alberta for a reasonable period after graduation.

Apply to the Administrator of Student Awards by August 1.

GRADUATE STUDIES AWARDS

THE FACULTY OF GRADUATE STUDIES

The following Scholarships and Fellowships are awarded primarily on a basis of academic standing. In general, awards are made only to applicants whose previous academic standing is either First Class or high Second Class.

Unless otherwise stated, awards are for one year only, but application for renewal will be considered. No award will be made to other than a full-time student. A few of these awards are not necessarily restricted to tenure at this university.

Unless the terms specify tenure on a 12-month basis, awards will normally be paid over the 8 month academic term September 1 to April 30.

In order that awards may be equitably distributed, no student may hold more than one major award in a given year. A major award is defined generally as $1,000.00 for 8 months or $2,000.00 for 12 months for a student in first year graduate work and $1,400.00 for 8 months or $2,400.00 for 12 months in subsequent years.

Holders of major awards may not accept a teaching or other assignment involving more than the equivalent of four hours per week during the academic session or a total of 100 hours during a 12 month period. Holders of awards must pay regular tuition fees unless stated otherwise.

The following awards are open in two or more Fields of Study:
For awards in a single field, see later.

University of Alberta Graduate Fellowship—This is the senior fellowship within the Faculty and is valued at $4,000 on a twelve-month basis. It is open to a student who has completed at least one year of graduate study and registers for a full-time program leading to either a Ph.D. and Ed.D. degree. An award winner is expected to carry out a full-time research program during the summer months. Tenure may begin May 1 or September 1.

Apply to Administrator of Student Awards by March 1.

Dissertation Fellowships. The University of Alberta will make available a number of Dissertation Fellowships of $3,600 over 12 months. These are designed for students who have a reasonable expectation of completing a doctoral program within the following 12 months. Tenure may begin between May 1 and October 1. Candidacy examinations must be passed before tenure begins.

Awards will be made on nomination from Departments. Nominations are due by March 1.

The Harold Hayward Parlee Memorial Fellowship. This fellowship, offered by The Winspear Foundation in memory of H. H. Parlee, Chairman of the Board of Governors of the University of Alberta from 1940 to 1950, is valued at $3,600 on a twelve-month basis, and is open to students who have completed at least one year of graduate study and register for a full-time program leading to either a Ph.D. or Ed.D. degree. An award winner is expected to carry out a

full-time research program during the summer months. Tenure may begin May 1 or September 1.

Apply to Administrator of Student Awards by March 1.

Province of Alberta Graduate Fellowships. A number of fellowships valued at $3,600 each, on a twelve-month basis, are open to students who have completed at least one year of graduate study and register for a full-time program leading to either a Ph.D. or Ed.D. degree. Award winners are expected to carry out a full-time research program during the summer months. Tenure may begin May 1 or September 1.

Apply to Administrator of Student Awards by March 1.

Province of Alberta Graduate Scholarships. A number of scholarships valued at $3,000 or $2,500 each on a twelve-month basis, are open to students in any year of graduate study. Normally awards of $3,000 will be made only to students who have completed at least one year of graduate work. The usual award for students during the first year of graduate study will be $2,500.

These scholarships are intended to encourage winners to do full-time research during the summer months but the twelve-month term of award is not obligatory. Tenure may begin May 1 or September 1, and may be teminated by either the student or the University at any time after the end of the academic year. In case the scholarship is held for less than twelve months, the amount will be reduced proportionately.

Apply to Administrator of Student Awards by March 1.

Graduate Teaching Assistantships are available in many Departments. Normal values for full-time assistantships for the 8 month academic session range from $1,800 to $3,000 plus tuition fees. Limited travel assistance will be paid to appointees coming 1,000 miles or more. Full-time assistantships normally require 12 hours teaching work per week. Additional assistance for the 4 month intersession may be available.

Apply to Head of Department concerned by March 1.

Graduate Service Assistantships are available in a number of Departments. Terms are the same as for Teaching Assistantships except that the work involved will be to assist with Departmental research.

Apply to Head of Department concerned by March 1.

Graduate Research Assistantships are available in many Departments. These normally permit full-time graduate study programs. They carry total values of either $2,000 for 12 months for the first year of graduate study and $2,400 for subsequent years plus fees, or $2,300 and $2,700 respectively from which fees must be paid.

Apply to Head of Department concerned by March 1.

Intersession Bursaries. A considerable number of Intersession Bursaries of $1,000 each will be awarded each year to students already engaged in a program leading to a graduate degree, who are prepared to spend not less than four months of the Intersession on a full-time graduate program, which may include not more than one formal course requisite to the program during that period. Holders of 12-month awards are not eligible. Awards for less

than four months may be made where circumstances warrant. Tenure must begin May 15.

Awards will be made on recommendation of Departments. Recommendations will be requested by March 1.

The W. J. Gage Limited Research Fellowship of the value of $3,000 on a twelve-month basis is offered to a suitably qualified student in a Ph.D. program in Psychology or Educational Psychology at Edmonton for research in concept formation in and through language, preferably in children.

Apply to the Administrator of Student Awards by March 1.

The Francis F. Reeve Foundation Graduate Bursaries—The Francis F. Reeve Foundation offers five Graduate Bursaries valued at $2,400 each on a twelve-month basis. The awards are open to graduates of any university who are engaged in, or admissible to, a program leading to a graduate degree at the University of Alberta in any field of study for which facilities are available, and will be made on the basis of scholastic attainment and financial need. Tenure may begin May 1 or September 1.

The C.I.L. Fellowship—A fellowship of $2,000.00 per year plus $400.00 supplementary grant to the University is offered by Canadian Industries Limited for study and research leading to a doctorate degree in Chemistry or Chemical Engineering. The fellowship will be open to university graduates who are Canadian citizens or to university graduates who are intending to follow a career in Canada, with preference to Canadian citizens. Upon completion of the year's work, the fellow shall submit to Canadian Industries Limited a written report outlining work performed under the fellowship or alternatively a copy of the thesis prepared for his degree. Each award shall be in respect of one year, but, in the event that a fellow shows by his progress and application that such a course is desirable, the fellowship may be awarded to the same person for a further term of one year.

Apply to Administrator of Student Awards by March 1.

The Pan American Petroleum Corporation Fellowship of $1,800 over 12 months plus tuition fees is offered to a student of high academic merit for graduate study and research in Engineering, Geology or Geophysics at the University of Alberta. Preference will be given to an applicant whose project is the field of the Petroleum Industry.

Apply to Administrator of Student Awards by March 1.

The Delta Delta Delta Alumnae Fellowship of $1,000.00 is offered annually by the Delta Delta Delta Alumnae of the University of Alberta, to a woman student of outstanding academic merit graduated from a degree program of the University of Alberta and proceeding in a full-time program towards a post-graduate degree either at this or any other accredited university. Preference will be given to a student in her first year of graduate work immediately following her undergraduate degree.

Apply to the Administrator of Student Awards by March 1.

The Henry Marshall Tory Memorial Scholarship of $300.00 is offered by the University of Alberta Alumni Association in honor of the first President of the

University. It is intended to promote graduate study and research in fields related to mental health. It is restricted to graduates of the University of Alberta and will be paid only when the recipient registers for a full intramural program at the University of Alberta or at another approved graduate school.

Apply to Administrator of Student Awards by March 1.

The W. S. Buchanan Book Prize of $100 will be awarded annually to a graduate student of outstanding merit—alternately in the Department of History and the Department of English. The award will be made on nomination by the department.

The William Rea Scholarship of $1,000 is offered annually by William Rea, Jr. in honor of his father, a pioneer Edmonton educator. The scholarship is open to a University of Alberta graduate or graduating student who shows the best aptitude in terms of scholarship and extra-curricular activity for a television career in drama, music, writing, photography, engineering or business. The student may attend any recognized graduate school which will further his training in this area, and the scholarship may be renewed for one or more years in appropriate circumstances.

Definite details should be given as to the field of study in which the candidate desires to work.

Apply to Administrator of Student Awards by March 1.

The following awards are open in one Field of Study only (as listed alphabetically):

AGRICULTURE

The J. Macgregor Smith Graduate Scholarship in Agricultural Engineering of $1,000 will be offered annually to a student of outstanding merit for Graduate study in the Department of Agricultural Engineering. In the event, in any one year, that a suitable candidate is not available the money may be used for two undergraduate awards in the same Department.

Apply to Administrator of Student Awards by March 1.

The Canadian Sugar Factories Limited Scholarship of $500 is offered for graduate study in Agriculture at the University of Alberta with preference being given to research relating to irrigation farming.

Apply to the Administrator of Student Awards by March 1.

The Dan Baker Graduate Bursary of $300 is provided under the will of the late Dan Baker of Edmonton. It is open to graduates of the Faculty of Agriculture, University of Alberta, who are proceeding to postgraduate work at the University of Alberta. (In the event that no suitable candidate applies, the award may be made to an undergraduate on the same terms as for the Dan Baker Undergraduate Bursary.)

Apply to the Administrator of Student Awards by March 1.

CHEMISTRY

The Professor Osman James Walker Scholarship in Chemistry—See Undergraduate Awards, Department of Chemistry.

EDUCATION

The International Nickel Company of Canada Graduate Fellowship in Educational Administration of the value of $2,400 over 8 months is offered annually for graduate study in Educational Administration at the University of Alberta.

Application forms are obtainable from the Head, Department of Educational Administration, University of Alberta and should be returned by March 1.

ENGINEERING

The Chemcell Limited Fellowship of $2,400 on a 12-month basis is offered annually to a graduate in Engineering to pursue post-graduate studies in Chemical Engineering at the University of Alberta. If the student is in a doctoral program the award may be renewed for a second term. In addition the donor will provide a grant of $600 to the Department to support the research recipient.

Apply to the Administrator of Student Awards by March 1.

The Sherritt Gordon Mines Limited Graduate Scholarship in Metallurgy of $1,000 will be offered annually to a student of outstanding merit doing post-graduate work in Metallurgy.

Apply to Administrator of Student Awards by March 1.

The Giant Yellowknife Mines Scholarship in Minining Engineering of $2,000 will be offered annually to a suitably qualified student for post-graduate study relating to Mining Engineering. In addition, the donor will provide a grant of $500 to the Department for auxiliary costs and expenses.

Apply to Administrator of Student Awards by March 1.

ENGLISH

The James Patrick Folinsbee Memorial Scholarship in Creative Writing of $800 will be offered annually to a graduate of outstanding ability whose primary interest is in the field of creative writing and who will be pursuing a post-graduate degree program in English Literature. The scholarship will be open to graduates of other universities to attend the University of Alberta or graduates of this University to attend here or elsewhere.

Apply to Administrator of Student Awards by March 1.

HISTORY

The Men's Canadian Club of Edmonton Prize of $200 is offered annually to a student of high academic merit for graduate study in the field of Canadian History at the University of Alberta. It is suggested that this be used to acquire books in this field.

MEDICINE

The Doctor D. S. Macnab Bursary—The Calgary Associate Clinic has founded the Doctor D. S. Macnab Bursary of $250.00 available to recent graduates for the purpose of giving aid to postgraduate studies or research in Medicine or Surgery. Under special circumstances, it may be given to undergraduates.

It will be awarded by the Faculty of Medicine, and applications should be forwarded to the Administrator of Student Awards by March 1.

The Dorothy Jean Usher Memorial Scholarship for Medical Research—The Dorothy Jean Usher Memorial Scholarship for Medical Research consists of the

income from a capital endowment of $10,000.00, given by Thomas Usher in memory of his daughter, a graduate of the University of Alberta School of Nursing. It is offered to a graduate or an undergraduate for research work in the Faculty of Medicine of the University of Alberta on some aspect of medicine, with preference given to investigations relating to leukaemia.

Apply to Administrator of Student Awards by March 1.

The Vessie Heckbert Memorial—refer to Faculty of Medicine.

PHARMACY

The Warner-Lambert Graduate Fellowship of the value of $1,200 is offered annually to a student of outstanding merit undertaking graduate work in Pharmacy. A supplementary grant of $300 for equipment and supplies will also be made to the Faculty of Pharmacy.

The Pfizer Research Scholarship of the value of $300 is offered annually to an outstanding Pharmacy graduate of the University of Alberta who is undertaking graduate work, preferably in hospital pharmacy or biopharmacy.

PSYCHOLOGY

The Lamond, Dewhurst and Associates Ltd. Scholarship of $200 will be offered to a post-graduate student in the Department of Psychology at the University of Alberta, preferably to one who is studying in the field of Industrial Psychology.

Apply to the Administrator of Student Awards by March 1.

GRADUATE AWARDS MADE BY OTHER INSTITUTIONS

It is requested that any student who is awarded one of these, report such to the Administrator of Student Awards as a matter of information.

The following awards are open in two or more Fields of Study.

For awards in a single field, see later.

The Bank of Nova Scotia Bilingual Exchange Scholarships. Six awards will be made annually, three to French-speaking candidates and three to English-speaking candidates. Values are $1,500 for undergraduates and $2,500 for graduate students. Undergraduate awards are tenable in the second last year of a normal undergraduate program. English-speaking winners may attend any Canadian French-speaking university or college and French-speaking winners may attend any Canadian English-speaking university or college, provided that such institution is a member, or federated with, or affiliated to, a member of the Association of Universities and Colleges of Canada.

Apply to Director of Awards, Association of Universities and Colleges of Canada, 151 Slater Street, Ottawa 4, Ontario. Completed applications must be filed by March 15.

The British American Oil Company Limited Graduate Fellowships. Five fellowships of $3,000 to the student plus $1,000 to the department of the university, will be offered annually and are open to residents of Canada who are graduates of a Canadian university, for graduate study in any field at a Canadian university.

Application forms may be obtained from Director of Awards, Association of Universities and Colleges of Canada, 151 Slater Street, Ottawa 4, and must be filed complete by March 1.

British Council Scholarships. Three scholarships are offered annually to graduates of Canadian universities to provide opportunity for advanced study or research (including Fine Arts, Music and Drama) in the United Kingdom. They are not primarily intended to enable the holders to obtain University degrees or other professional or practical qualifications, although with special permission they may be allowed to do so if this does not involve an extension of the scholarship period. Preference is given to candidates who are between 25 and 35 years of age. The scholarships are normally tenable from October 1st for one academic year of ten months or very occasionally for two academic years (22 months). A full scholarship includes fares to and from the United Kingdom, tuition fees, personal maintenance grant, a grant for books and apparatus of £30 per annum and approved travelling expenses in the United Kingdom. The scholar must return to his own country at the end of his scholarship. Candidates must be graduates at the time of application.

Prospective applicants should write for further information and application forms to the British Council, 80 Elgin St., Ottawa 4 Ontario. Completed applications are due December 1 for scholarships commencing the following October.

The Canada Council Awards—These are provided in the fields of the arts (defined as architecture, the arts of the theatre, literature, music, painting, sculpture, the graphic arts and other similar creative and interpretative activities), the humanities and the social sciences.

Pre-Doctoral Fellowships. Value $2,000 to $3,000. Apply by December 1.

Candidates must have completed one year of graduate study by the date of taking up an award.

Travel grants may be given in addition where necessary.

Further information may be obtained from the Administrator of Student Awards or by writing direct to The Canada Council, 140 Wellington St., Ottawa.

The Canadian Federation of University Women Fellowships. The Federation offers four fellowships annually to women who hold a degree from any Canadian University. The awards are based on evidence of character, intellectual achievement, and promise of success in the subject to which the candidate is devoting herself. The proposed place and plan of study must be approved by the Federation.

The four fellowships are as follows:

(1) **Travelling Fellowship** of $2,500. This is open to any woman student whose domicile is in Canada, although an applicant may be studying elsewhere at the date of application. It is intended for students already well advanced in a doctoral program.

(2) **Margaret McWilliams Fellowship** of $2,000. This is open to applicants who wish to carry out doctoral study or research abroad. Preference will be given to those who have already started their graduate study.

(3) **Junior Fellowship of $1,500.** This is open to any woman student whose domicile is in Canada and who intends to embark on a Master's program.

(4) **Professional Fellowship** of $1,500. This is open to applicants whose domicile is in Canada. Preference will be given to candidates who have completed one or more years of professional work and who desire to spend a year at an accredited Library School, College of Education, or similar professional school.

Application blanks and further information may be obtained from the Chairman of the Fellowship Committee, Miss Jean Royce, 140 Stuart St., Kingston, Ontario. Applications and all other necessary documents must be received in Kingston not later than February 1.

In addition the C.F.U.W. will select Canadian candidates for various awards granted by the American F.U.W. and the International F.U.W. Application dates are December 1 and November 1 respectively.

Chemcell Limited Fellowships. Six fellowships of $2,500 each are offered annually to Canadian residents or graduates of a Canadian university for postgraduate study in Canada in Engineering, Chemistry, Physics or Mathematics. In addition a $1,000 grant-in-aid will be provided to the Department involved.

Apply to Director of Awards, Association of Universities and Colleges of Canada, 151 Slater St., Ottawa 4, Ontario.

The Chevron Standard Limited Graduate Fellowships—The Chevron Standard Limited offers annually five graduate fellowships which are tenable in selected Canadian universities to students proceeding to a graduate degree in one of the fields of Geology, Geophysics, or Petroleum Engineering The fellowships are tenable for one year in the amount of $1,000 each, plus a grant of $500 to the university department concerned. The awards are primarily intended to assist male Canadian students who are interested in the Earth Sciences or Petroleum development and production. They will be awarded on the basis of scholastic ability, field of interest, the recommendation of the Department in which the student plans to conduct his graduate work, plus the concurrent recommendation of the Head of the Department in which the student conducted his undergraduate studies. Application forms which list the universities in which the fellowships are tenable may be obtained from the Administrator of Student Awards, the Department Head, or by writing directly to the Company. They should be prepared in duplicate, one copy to be forwarded to the Head of the Department in which the candidate is applying for admission, and the other to the Secretary, Aids to Education Committee Chevron Standard Limited, 329A-6 Avenue S.W., Calgary, Alberta, prior to March 31st of the year in which the graduate program is to be undertaken.

The Civil Service Association of Alberta Graduate Scholarship of $1,000 will be offered annually to a graduate of any recognized university commencing his first year of postgraduate study at either the same or any other recognized university. An applicant must be a member of the said Association or a son, daughter, husband or wife of a member. These is no restriction on field of study but preference will be given to an applicant whose research project is, in some measure at least, of interest and value to the people of Alberta.

Application forms may be obtained from the Executive Secretary, The Civil Service Association of Alberta, 10008 - 106 St., Edmonton, and should be returned with supporting documents by March 1.

The Commonwealth Scholarships. This is a joint plan to exchange approximately one thousand postgraduate students within the Commonwealth. Each Commonwealth country accepts and provides for a certain number of students from other Commonwealth countries. Scholarships are normally for a period of two years and cover all expenses and travel. Recipients need not be working towards a degree in the other country, but may be doing a year or more of research towards a degree from their home University.

Application dates vary for different countries, especially those in the Southern Hemisphere. Application date for those tenable in the United Kingdom will be October 31 of the year preceding the one in which the award is tenable.

Apply for information to Administrator of Student Awards.

Recent Commonwealth Scholars have been: 1961, Richard W. Bide, Ian K. Steele, Morley S. Lipsett, David G. Fish; 1962, Adolf Buse, A. Roy McKenzie, Walter A. Yakimets; 1963, Robert Church; 1964, Alan G. Meech, Gary D. Willis; 1965, Bentley LeBaron, Sheila Malm, Paul Unrau.

The 1851 Exhibition Science Research Scholarship—Three of these scholarships are granted each year in Canada. They are to the value of £750 (plus

£250 provided by the National Research Council of Canada) per annum for two, or in rare instances, three years, together with certain possible allowances for fees and travelling expenses. The object of the scholarship is "to enable selected students of overseas universities who have already completed a full university course and given evidence of capacity for scientific investigation to devote themselves for two years to research work under conditions most likely to equip them for practical service in the scientific life of the Commonwealth."

A candidate must be (a) a British subject, (b) less than 26 years of age, except in very special circumstances, such as national service during the war. The candidate must have been a student of science in a university or university institution for a period of not less than three years, and must have spent one full academic year ending not more than twelve months prior to the date of recommendation at the institution by which he is recommended.

The scholarship is tenable in the United Kingdom or abroad, but not normally in a country in which the student has already studied.

Students intending to apply for this scholarship should communicate with the Administrator of Student Awards before February 1 so that applications may be in London by March 21

The Imperial Chemical Industries and The Turner and Newall Research Fellowships. These fellowships are tenable at the University of London and are of the value of £1,000-£1,200 per annum for three years.

The Imperial Chemical fellowships are for study in Biochemistry, Chemistry, Chemotherapy, Engineering, Metallurgy, Pharmacology or Physics.

The Turner and Newall fellowship is for study in Engineering, Inorganic Chemistry or Physics.

Detailed regulations and applications may be obtained from the Academic Registrar, University of London, Senate House, W.C.I. They must be received complete by him by April 1.

The I.O.D.E. War Memorial I Postgraduate Overseas Scholarship—The scholarship, founded by the Imperial Order Daughters of the Empire, as part of the war memorial of the Order, is tenable for one year in any university in the British Commonwealth, the subjects of study being specified as History, Economics or Constitutional Government, or any subject vital to the interest of the Commonwealth. Values of the awards are $2,300 if taken outside of Canada and $2,000 if taken in Canada. Recipients may accept other awards up to $2,000 if outside of Canada and up to $1,000 if in Canada.

The selection of a candidate will take place during the month of November. The candidate selected must be prepared to begin his or her course in Great Britain in the following autumn.

Candidates may be men or women. They must be British born, naturalized allies, or naturalized neutrals, with at least five years' residence in Canada. Except in the case of a returned solider, sailor or airman, they must have passed their twentieth but not their thirtieth birthday in October of the year during which they begin their course. Each candidate must hold a degree from

a recognized university or degree-granting college in Canada and must have done or be doing postgraduate work. A candidate shall apply in the province in which the university from which he or she graduates is situated, irrespective of his or her place of residence in Canada. In provinces where there is no university, the War Memorial Committee in that province may grant the scholarship toa man or women from that province who has graduated from any Canadian university of college and has done or is doing postgradaute work. Candidates from a province having no university may apply only in that province, not in the province where they are attending college or have taken a degree.

In choosing the scholars, the Committee of Selection will give consideration not only to literary and academic attainments, but also to personal character and physical fitness. If possible, personal interviews with the candidates will be arranged.

Application is to be made to the I.O.D.E. Scholarship Secretary, Mrs. D. F. Rutherford, 5452-111A Street, Edmonton, Alberta, not later than October 15.

Recent I.O.D.E. Scholars have been: 1959, Frederick G. Hulmes; 1960, John Irvin Daeley; 1961, John Irvin Daeley; 1962 and 1963, Donald E. Webber; 1964, Judith Rendle; 1965, J. Bentley LeBaron; Howard R. Falle.

The I.O.D.E. War Memorial II Postgraduate Overseas Scholarships—Four scholarships for Canada founded by the Imperial Order Daughters of the Empire, as part o ftheir memorial for World War II, are tenable for one year in any university in the British Commonweath, the subjects of study being specified as the Humanities.

The values and terms are otherwise similar to those for the War Memorial I Scholarship.

Graduates of the University of Alberta should make application to the I.O.D.E. Scholarship Secretary, Mrs. D. F. Rutherford, 5452-111A Street, Edmonton, Alberta not later than October 15.

Imperial Oil Graduate Research Fellowships. The Imperial Oil Limited offers annually five research fellowships of $2,500 per year in Canadian funds for a period up to three academic years. Three fellowships are offered in the fields of Pure and Applied Science including Mathematics and two are offered in the Social Sciences and Humanities. These are open to graduates of any approved university in Canada and may be tenable at any university, approved by the donor, for graduate studies leading to a doctor's degree.

Universities wishing to sponsor one or more students should address their applications to the Imperial Oil Scholarship Committee, Imperial Oil Limited, 111 St. Clair Avenue West, Toronto 7, Ontario, by March 1.

Any student who wishes to be sponsored for this award should apply to the Administrator of Student Awards not later than February 15.

International Nickel Graduate Research Fellowships have been established to encourage academic research in the technical fields serving Canadian metal industries and to stimulate advanced study in industrial science in Canada. A number of fellowships of $3,000 each are tenable annually at Canadian

Universities. In addition, a $500 grant-in-aid will be made to the Department in which the fellow is working. The normal tenure is one year but application may be made for renewal through second or third year. Awards will not normally be given in the second year of a Masters program or the fourth year of a doctorate. The fields of research are: Chemistry or Physics of Metals, Geology (including Geophysics and Geochemistry), Metallurgy (both Physical and Extractive including Mineral Dressing) and Mining.

Applications must be endorsed by the University and must be channeled through the Student Awards Office. Application is to be by letter from the student's supervisor, giving full details of the proposed study project, an evaluation of the applicant, and must be accompanied by a transcript.

Applicants should be in the Student Awards Office by January 31 in order to be forwarded to The International Nickel Company by February 14.

The Johnson's Wax Fund Graduate Scholarship—The Johnson Foundation, Racine, Wisconsin, makes available annually to a least one student graduating from a Canadian University an award designed to cover the cost of travel and one academic year of study at a United States University or College of the student's selection.

Applications should reach the Administrator of Student Awards not later than December 15 so that they may be forwarded to Brantford, Ontario by January 15.

The Frank Knox Memorial Fellowships of $3,500, will be offered annually to two male Canadian citizens for one year's postgraduate study at Harvard University. Special consideration will be given to extra-curricular activities.

Applications must be made through the student's own University by November 15, so that completed applications may be in Ottawa by December 1. Information may be obtained from the Student Awards Office.

The Massey Foundation Fellowships each of $2,000 to $2,500 per annum, are offered to Canadian citizens for graduate study at the American University, Washington, D.C. Applicants must have received, or be close to completing, a Bachelor's degree with high standing, and must be eligible for admission to graduate study at the American University. Fields of study are chiefly Arts and Science, Business Administration and Education. Applications fully documented, must reach the American University not later than March 1 of each year. For further information write to the office of the Graduate School, the American University, Washington 16, D.C. or contact the Student Awards Office.

The Mackenzie King Travelling Scholarships. Several scholarships of $1,500 each will be offered to graduates of Canadian universities for postgraduate study in the United States or the United Kingdom in the field of International or Industrial Relations (including Law, History, Politics or Economics).

Personal qualities and aptitudes will be considered as well as academic standing.

Apply to Dean Walter H. Gage, University of British Columbia, Vancouver 8, Canada, by March 1.

The National Research Council Scholarships—The National Research Council offers annually postgraduate scholarships on a twelve-month basis to graduates with pre-eminent ability in the sciences, mathematics, engineering and applied psychology. These are offered in four classes: Bursaries (in Canada only) to the value of $2,500; Studentships (in Canada only) to the value of $3,000; Special Scholarships (outside Canada) to the value of $3,000; Postdoctorate Overseas Fellowships (outside Canada and United States) to the value of $4,500 single and $5,500 married.

In all cases a travel allowance is made where necessary.

Applicants for Bursaries or Studentships must be Canadian citizens or landed immigrants; or foreign students attending, or who have graduated from, a Canadian university.

Application forms and general regulations may be secured from the Administrator of Student Awards, University of Alberta. Completed applications for Bursaries should be filed with the Administrator of Student Awards by January 15. Completed applications for other awards must be received by the Council in Ottawa by January 15.

The P.E.O. International Peace Scholarship is offered to qualified foreign women students who must have a full-time graduate status working toward a degree. Inquiry should be made early in January so that completed applications, recommendations and necessary forms may be on file with the Chairman of the P.E.O. International Peace Scholarship by January 31 of the year for which the award is requested. Awards are announced about May 1. $2,100 will be the maximum granted in one calendar year. Further information may be secured from the Administrator of Student Awards, or Mrs. S. G. Davis, 9118 - 116 St., Edmonton.

The Rhodes Scholarship—A Rhodes Scholarship is tenable at the University of Oxford and may be held for three years. Since, however, the majority of Rhodes Scholars obtain standing which enables them to take a degree in two years, appointments are made for two years in the first instance, and a Rhodes Scholar who may wish to remain for a third year will be expected to present a definite plan of study for that period satisfactory to his College and to the Rhodes Trustees.

The stipend of a Rhodes scholarship is fixed at £900 per year. At most colleges and for most men this sum is not sufficient to meet a Rhodes scholar's necessary expenses for term time and vacations, and scholars who can afford to supplement it by say £50 per year from their own resources will find it advantageous to do so.

CONDITIONS OF ELIGIBILITY—A candidate, to be eligible, must:

1. Be a male Canadian citizen or British subject, with at least five years' domicile in Canada and unmarried. He must have passed his nineteenth, but not his twenty-fifth birthday on October 1 of the year for which he is elected.
2. Have reached such a stage in his course at one of the universities of Canada that he will have completed at least two years at the university in question by October 1 of the year *for* which he is elected.

In making nominations, Committees will have regard to the qualities laid down by Mr. Rhodes in that section of the Will in which he defined the general type of scholar he desired;

> Literary and scholastic attainments; qualities of manhood, truthfulness, courage, devotion to duty, sympathy for and protection of the weak, kindliness, unselfishness and fellowship; exhibition of moral force of character and of instincts to lead and to take an interest in his fellows; physical vigour, as shown by fondness for or success in manly outdoor activities.

Candidates may apply either for the province in which they have their ordinary private domicile, home or residence, or for any province in which they have received at least two years of their college education before applying.

Each candidate for a scholarship is required to make application to the Secretary of the Committee of Selection in the province in which he wishes to compete not later than November 1.

Full particulars can be obtained from Mr. J. E. Redmond, 7th fl., Bank of Montreal Bldg., Edmonton, Alberta, Secretary of the Selection Committee for the Province of Alberta.

Recent Rhodes Scholars have been: 1960, Henry Russel Glyde; 1961, Bernard Leo Adell; 1962, John Peter Unrau; 1963, Sheldon Chumir; 1964, Wesley Cragg, 1965 J. Andrew Brook.

Rotary Foundation Fellowships. These are provided by Rotary International for graduate study in a country other than the student's home country. Applicants must be single, male, and must be over 20 but not over 29 years of age. Preference will be given to studies in the humanities, languages or social sciences but other fields will be considered.

The fellowship is for one academic year and covers return travel, tuition fees, books, living and incidental expenses. Rotary District No. 536, comprising Alberta and adjacent parts of Saskatchewan and British Columbia selects such a candidate every other year.

Application with supporting documents should be made by March 15 of any even-numbered year for the fellowship to begin in the next following odd-numbered year. Applications should be filed with the nearest Rotary Club. For further information contact the Administrator of Student Awards, University of Alberta or the nearest Club within the above-mentioned District.

Recent Rotary Fellows have been: 1959, Robert Roy Stuart (Oxford); 1961, Lawrence A. Mysak (Adelaide); 1963, Guy Doll (Poitiers); 1965, Gareth S. Gardiner (Edinburgh).

The Rutherford Scholarship of the Royal Society—of the value of £800 to £1,050 per annum plus allowances for travel and tuition fees is available for experimental research in any branch of the natural sciences, but if there are candidates of similar merit preference will be given to experimental physics.

Applications should be made not later than Febrary 1 on the Exhibition of 1851 forms.

Shell Postgraduate Scholarships. Two scholarships of £1,000 each per annum for two years are offered to male British subjects with at least 5 years residence in Canada, and under 25 years of age. Travel assistance may be given.

These scholarships are tenable in an approved University in the United Kingdom in any of the following studies: Chemistry, Physics, Chemical Engineering, Engineering, Geophysics or Geology. The student should be working to a Master's or Doctor's degree and should already have completed or expect to complete one year of postgraduate study.

Information may be obtained from the Administrator of Student Awards and applications must be in Ottawa by January 20.

Soroptimist Federation of the Americas Inc. The Western Canada Region of the Federation offers a fellowship of $1,500 to a woman student, either graduating or a graduate, whose home is in Western Canada, and who is in need of financial assistance. The award is for postgraduate study at any university. The award is normally made only every other year, in the even years.

Application forms may be obtained from the Administrator of Student Awards. They must be forwarded to the Federation by March 1. A decision will be made by June 30.

The Woodrow Wilson National Fellowships, each providing a stipend of $2,000 for one year, plus tuition costs and allowances for dependent children, are available to outstanding students who are either undergraduates in their final year or graduates who have not yet entered a liberal arts graduate school. The intention of all applicants must be to prepare themselves by graduate study for a career in college teaching in the natural or the social sciences or the humanities. These are tenable in the United States or Canada.

In the first instance, candidates are nominated by faculty members. Since nominations must reach the officers of the Fellowship Foundation no later than October 31 for Fellowships tenable in the next academic year, intending candidates should get in touch with the head of the department concerned as early as possible in the first term.

Recent Woodrow Wilson Fellows have been: 1962, Adolf Buse, Kurt Rees; 1963, Morris Aizenman, Richard Mansfield, Ronald McClung, Gunter Muecke, John Ower, Ross Rudolph, Bastiaan van Fraassen, Thomas Wood; 1964, Patricia Clements, Hans Reich; 1965, Brian D. Sykes, Henry D. Rempel, Ormand S. Mitchell, Graeme D. McDonald.

The following awards are open in one Field of Study only, as listed alphabetically.

DENTISTRY

The National Research Council Dental Fellowships—The Council offers annually a limited number of Fellowships for promising graduates in dentistry who have spent at least one year in postgraduate training or who have had experience in research work. Applications must be received by the Council by February 1. Application forms and general regulations may be secured from the Administrator of Student Awards or by writing direct to the Council, Sussex Dr., Ottawa.

The Postgraduate Scholarship Fund in Dentistry has been established through the generosity of members of the Dental profession. The purpose of this fund is to assist dental graduates in pursuing postgraduate studies at other

institutions in preparation for teaching. Younger persons will be given preference. Applications should be made to the Dean. All applications must be submitted to the Council of the Faculty of Dentistry for approval.

The Canadian Dental Association Fellowships and Studentships. The Canadian Dental Association offers fellowships and studentships to suitable students or graduates who desire to prepare themselves further for scientific research by continuing their study in the sciences fundamental to their research fields.

(a) Fellowships are for an academic year of special study in the fundamental sciences or for travel to visit outstanding authorities or to attend research conferences.
(b) Studentships are for summer or part-time employment as an assistant in a recognized research laboratory.

Factors considered in making the awards are: evidence of capacity for original research, and scholastic ability in scientific fields.

The candidate shall state the institution at which he intends to study and the general line of work to be followed. A transcript of university record and a letter of recommendation from the dean of a dental school should accompany the application.

Apply to Canadian Dental Association, 234 St. George Street, Toronto 5, Ontario by April 1.

EDUCATION

The John Walker Barnett Fellowship in Education of $2,400 is offered to residents of Alberta, who are members of the Alberta Teachers' Association, and who are admitted to the Faculty of Graduate Studies of the University of Alberta for intramural study at a regular winter session on a doctoral program in education. This fellowship is open to students enrolled for doctoral work in any one of the Departments of the Faculty of Education.

Application forms are obtainable from the Executive Secretary, Alberta Teachers' Association, Barnett House, Edmonton and should be returned by March 15.

The Alberta Teachers' Association Graduate Scholarships in Education, each in the amount of $500, are offered annually to students who, having graduated with a Bachelor of Education degree from the University of Alberta, are proceeding to graduate work. Each applicant must be a bona fide resident of Alberta. He must give evidence of superior academic and professional promise, capacity for leadership, and intention to follow teaching as a career. The scholarship is payable upon registration for intramural study during a regular session in the graduate school of a university of recognized standing, provided that such study be commenced not later than two years following the award.

Application should be made to the Executive Secretary, Alberta Teachers' Association, Barnett House, Edmonton, not later than May 15.

ENGINEERING

The Athlone Fellowships—Her Majesty's Government in the United Kingdom has established a number of Fellowships to enable Canadian engineering graduates to take postgraduate training in the United Kingdom. The fellowships will be in two groups:

(a) thirty-one available for graduates immediately after graduation;
(b) a further ten available for graduates who have already spent some time in industry.

The Fellowships will cover the costs of transport, tuition fees and maintenance and be tenable normally for a maximum period of two years.

Apply to the Administrator of Student Awards by October 15.

Recent Athlone Fellows have been: 1963, Walter C. Harrison, Joseph D. Wright; 1964, Robert Frederking, Cornelius Muilwyk; 1965, John D. Roberts, Harry S. Stinchcombe; 1966, Arthur T. Caston, Otto I. Szentesi, John T. Blair.

Canadian Good Roads Association Scholarships—Several scholarships, each valued at $2,000.00 and tenable for one year, are offered annually through the Canadian Good Roads Association for graduate study in Transporation Engineering.

Applications should reach the Association at 270 McLaren Street, Ottawa, not later than April 15.

Further information may be obtained from the office of the Dean, Faculty of Engineering.

The Franki Fellowship, of $1,750.00 per year plus $250.00 to cover expenses in connection with the research, is offered by Franki of Canada Limited, for graduate research in the field of soil mechanics at a Canadian university. The fellowship is open to any graduate in civil engineering of a recognized university and preferably a Canadian citizen or a resident of Canada.

A candidate for this fellowship should document his application with a transcript of university marks, a statement of experience and a clear outline of the research project contemplated. He should also request three or more instructors familiar with his work to send to the Administrator of Student Awards confidential statements indicating the merits of the applicant and their estimate of his ability to pursue graduate work. *A statement that the proposed research project could be carried forward satisfactorily at the University of Alberta is required from the head of the university department within which it would be conducted. A copy of the thesis is to be submitted to the donor.*

Applications should reach the Administrator on or before April 1, in order that they may reach the company not later than April 15. The decision of the company will be known not later than June 1.

Steel Company of Canada Fellowships in Metallurgy. Four fellowships of $2,500 each are offered annually to permanent residents of Canada who are graduates of a Canadian University, for research in Metallurgy. They are normally tenable for one year but in special circumstances may be renewed for a second year. In addition the donor provides a $1,000 grant-in-aid with each fellowship.

Further information may be obtained from the Administrator of Student Awards, University of Alberta. Completed applications must be sent to Canadian Universities Foundation, 75 Albert Street, Ottawa by February 28.

Alberta and Southern Gas Co. Ltd. Graduate Scholarship of $1,000 is offered annually for graduate study in Engineering at the University of Alberta. Preference will be given to an applicant whose research program will be in a field of specific interest to the natural gas industry.

Application forms may be secured from The Alberta and Southern Gas Co. Ltd., 503 Natural Gas Building, Calgary, and must be submitted by March 1.

GEOPHYSICS

The Society of Exploration Geophysicists Scholarships—The Society offers annually four scholarships of $500.00 each to Canadians majoring in Geophysics at Universities in Canada. The award will be based on academic record and financial need. Applicants may be matriculants entering first year University or undergraduates or graduate students.

Application forms may be secured from Canadian Society of Exploration Geophysicists Scholarship Sub-committee, P.O. Box 117, Calgary, Alberta, and should be returned completed to the same address by March 15.

LAW

The Carswell-Sweet and Maxwell Scholarship in Law—From 1960 a scholarship will be offered to be open to all final year and postgraduate law students in Canada, and which will be tenable for one year at Cambridge University. The student will be required to do postgraduate work in Anglo-Canadian Law. The value of the scholarship will be $2,000.00 and the cost of travel to Great Britain and return will be paid in addition. Application forms may be obtained from the Dean of the Faculty of Law.

The Viscount Bennett Trust Fund Scholarship—Under the terms of a deed of gift to the Canadian Bar Association from the late Right Honorable Viscount Bennett, P.C., K.C., LL.D., D.C.L., Honorary Life President of the Association, a trust fund known as the Viscount Bennett Trust Fund has been established. The annual income from the fund or the sum of $2,000, whichever is the less, will be paid annually as a scholarship for postgraduate study of law at an approved graduate school.

The scholarship is open to final year and graduate students of approved Canadian law schools, of which the Faculty of Law of the University of Alberta is one.

Applications for this scholarship should be received by the Dean of the Faculty of Law before October 15.

The Viscount Bennett (Law Society of Alberta) Graduate Scholarship of $2,500 is made available from a Trust founded by the late Viscount Bennett. It is offered to graduates of the Faculty of Law, University of Alberta, for postgraduate study in Law at The University of Alberta or at another recognized institution. Applicants should state an intent to return to Alberta following such study.

Apply to the Dean, Faculty of Law, by February 1.

MEDICINE

The Medical Research Council Fellowships ranging from $3,000 to $5,000 are offered for advanced training and experience in research in the medical sciences. Applicants must be Canadian citizens or residents of Canada and be not over 35 years of age. Awards normally are tenable in Canada and are for 12 months beginning July 1.

Apply by October 1 or January 1 to Medical Research Council, National Research Building, 100 Sussex Drive, Ottawa 2, Canada. For further information inquire of the Dean of Medicine or the Student Awards Office.

The Percy Hermant Fellowship in Ophthalmology of $1,000 will be offered annually by Imperial Optical Company to a medical graduate of a Canadian university for further study in Ophthalmology at the University of Alberta. Applicants must indicate an intention to subsequently practise this specialty in Canada.

Apply to Head, Division of Ophthalmology, Department of Surgery, University of Alberta, by March 1.

The University of Alberta Eye Research Fellowship of $5,000 per annum is offered to a medical doctor for post-graduate research under the auspices of the Retina Foundation—Institute of Biological and Medical Sciences in Boston, Massachusetts. A recipient may apply for renewal for a second or third year of work at the Retina Foundation. Applicants must be Canadian citizens and state an intention to return to Canada to practise.

Apply to Administrator of Student Awards, University of Alberta, Edmonton, by April 1 for the year beginning July 1.

NURSING

Professional Training Grants—Financial assistance is available to graduate nurses pursuing post-graduate study in any field of nursing. Applicant should be made to the Deputy Minister of Health, Department of Public Health, Administration Building, Edmonton, Alberta.

The University of Alberta Hospital School of Nursing Alumnae Association Scholarship—Financial assistance is available to graduates of the School to undertake post-graduate work in any field of nursing. Applications should be addressed to the Secretary of the Alumnae Association c/o, Office of Director of Nursing, University of Alberta Hospital.

SOCIAL WORK

The Mary A. Finlay Scholarship in Social Work of $1,000 per year for two years is provided by the Robert Tegler Trust for study in Canada, the United Kingdom or the United States, towards a Masters or Doctors degree in Social Work or related fields and will normally be awarded every alternate year. The second year will be dependent on satisfactory completion of the first year.

Applicants must be residents of the Province of Alberta and recipients will be required to agree to work in their profession within the Province for at least two years immediately upon completion of their advanced study.

Apply in writing with two letters of recommendation to the Trustees of the Robert Tegler Trust, 602 Tegler Building, Edmonton, by April 15 of the year in which the award is to be made. Inquiry should be made of the donor to determine in which year it will be available.

The Imperial Order Daughters of the Empire Bursary in Social Work of $500.00 is offered to a graduate of the University of Alberta or the University

of Calgary to take training at any recognized School of Social Work in Canada. When a successful candidate undertakes to two year program leading to a Master of Social Work degree, such candidate may apply for re-appointment for the second year. The application will be in open competition with those submitted for the first year of study.

Academic standing, suitability of personality, good health and financial need will be major considerations in determining this award.

Application forms may be secured from the I.O.D.E. Scholarship Secretary, Mrs. D. F. Rutherford, 5452-111A St., Edmonton, Alberta and should be submitted to her on or before June 1.

The Junior League of Edmonton Bursary for Post-Graduate Study in Social Work of an amount up to $1,500 is offered to a graduate of any recognized University to assist training at an accredited School of Social Work. The winner shall agree to work in an approved Social Welfare Department or Agency in the City of Edmonton for a period of one year immediately following completion of course. The bursary will be awarded on the basis of academic proficiency, suitability of personality and financial need. Preference will be given to those who have already been employed by a Welfare Agency.

Application forms should be secured from Mrs. J. P. Swan, 10622 - 83 Ave., Edmonton, and should be completed and returned to her by June 1.

The Kinette Bursary in Social Work up to the amount of $500.00 is offered by the Kinette Club of Edmonton to graduates of the University of Alberta, or to a graduate of another university resident in Alberta to take training at any recognized School of Social Work in Canada. Preference will be given to an applicant who intends to work in the Province of Alberta. Academic proficiency, suitability of personality and financial need will all be considered in making the award.

Application should be submitted by June 1 to Mrs. K. Hoiles, Chairman, Bursary Committee, Kinette Club of Edmonton, 7504 - 151 St., Edmonton, Alberta.

The P.E.O. Memorial Scholarship in Social Work of the value of $100.00 is offered by the P.E.O. Sisterhood, Edmonton Chapters, to a graduating woman student from the University of Alberta, Edmonton who intends to pursue studies in social work. The scholarship will be awarded to a student who attains at least second-class standing in her final year and will be paid only when she produces satisfactory evidence of registration in a recognized course of social work.

Apply to the Administrator of Student Awards by June 1.

WILDLIFE MANAGEMENT

C.I.L. Wildlife Management Fellowships—Fellowships of the value of $1,500, of which $1,200 is paid to the student and $300 to the Department in which the student is working, are available to any university graduate undertaking post-graduate studies in wildlife management at a Canadian university. Fellowship holders may receive summer grants of $1,000 to finance field work.

Apply through the Head, Department of Zoology, by March 15, so that completed recommendations may be forwarded to Educational Relations Manager, Canadian Industries Limited, Box 10, Montreal, P.Q. by March 30.

PROVINCE OF ALBERTA ASSISTANCE

I. DEPARTMENT OF EDUCATION

Under the Students Assistance Act (The Queen Elizabeth Education Scholarship Fund) assistance in various forms is available to students at the University of Alberta or the University of Calgary.

For matriculants and undergraduates this assistance is also available for attendance in a course of University level at a Junior College which is affiliated with either University, or at an approved College or University elsewhere if the course is not given in Alberta.

It is expected that students who might need financial assistance and whose homes are in Calgary or Edmonton will attend the campus in their home city if the program is available there.

For graduate study the assistance is available only for attendance in the Faculty of Graduate Studies at the University of Alberta or the University of Calgary.

Matriculants and undergraduates must be bona fide residents of Alberta. Applicants must be full-time day students in a regular academic session.

Province of Alberta Matriculation Scholarships

Scholarships are provided for students entering University the first time who had a matriculation average of 75% or better.

For details, see Matriculation Awards.

Province of Alberta Undergraduate Scholarships

Scholarships are provided for undergraduates with an academic standing in the previous year of 75% or better.

For details, see Undergraduate Awards.

Province of Alberta Graduate Fellowships

A number of fellowships of $3,600 each.

For details, see Graduate Awards.

Province of Alberta Graduate Scholarships

A number of scholarships of $2,500 to $3,000 each.

For details, see Graduate Awards.

Grants and Loans

These are available on a basis of financial need only. The amount of a grant depends on the academic standing of the previous year. A loan may be granted either in conjunction with, or separately from, a grant. Loans are repayable to the Provincial Government. Provincial loans will be made only to those students who have already had Provincial loan. Otherwise the Canada Student Loans Plan will be used.

Matriculants must have an average of at least 60%.

Application should be made to The Secretary, Students Assistance Board, Provincial Department of Education, Administration Building, Edmonton.

Undergraduates must have a previous year average of at least 60% for grants and at least 50% for loans.

Application from students attending at Edmonton should be made to the Administrator of Student Awards, University of Alberta, Edmonton.

Students who anticipate that they will need financial assistance any time during the session should apply as follows:

Medicine and Dentistry—by September 15.

Other Faculties—by October 1.

However, further applications will be accepted after these dates from students who could not anticipate their needs earlier.

Students should note that payment of Grants and Loans will not be available for about eight weeks after the closing date for applications and should plan their financing accordingly.

Graduate Students must have an average of at least 65% for either grants or loans.

Apply to Administrator of Student Awards preferably early in the fall session.

II. DEPARTMENT OF HEALTH

Dental Auxiliary Bursaries. A limited number of bursaries are available for students enrolled in the Dental Auxiliary program. They cover tuition fees, a monthly living allowance and a small book allowance. In return for the bursaries the recipients must undertake to work in a Health Unit in Alberta for 2 years.

Apply to the Director, School of Dental Hygiene at the date of registration.

III. DEPARTMENT OF PROVINCIAL SECRETARY

Scholarships at various levels of study are available in Drama, Handicrafts, Librarianship, Music and Recreation (including Fine Arts, Psychology and Sociology). There are various application dates. For further information apply to Department of the Provincial Secretary, Recreation and Cultural Development Branch, 424 Legislative Bldgs., Edmonton

Among these scholarships is the following:

CANADA STUDENT LOANS PLAN

The Canada Student Loans Plan was inaugurated in September 1964. Under this plan full-time students are permitted to borrow, on a basis of financial need, up to the extent of $1,000 per academic session and an aggregate of $5,000. Applicants must be Canadian citizens or have lived in Canada for at least a year and state an intention to live in Canada after graduation.

Students entering university for the first time should apply through the Students Assistance Board, Provincial Department of Education, Edmonton.

Undergraduate or graduate students attending at Edmonton should apply through the Student Awards Office, University of Alberta, Edmonton.

Students whose home residence is in another Province should apply through that Province.

The same application form covers both the Provincial Students Assistance Act and the Canada Student Loans Plan.

OTHER FORMS OF FINANCIAL ASSISTANCE

University Student Loan Fund—Through the generosity of private donors the University has at its disposal a Loan Fund from which loans may be made to students attending the University of Alberta, who could not otherwise complete their studies. In special circumstances loans may also be considered for Alberta students taking courses at an institution of University level elsewhere. Applicants must be making satisfactory academic progress. Interest at 5% per annum will be charged on loans.

Apply to Administrator of Student Awards, Edmonton.

Leonard Foundation Scholarships—The income of a trust created by the late Lieut.-Col and Mrs. R. W. Leonard, St. Catharines, Ontario, will be expended in paying part of the college expenses of selected students at several institutions of Canada, including the University of Alberta or the University of Calgary, for from one to four years. The details of qualification and the procedure of application for these scholarships may be secured by corresponding with the trustees of the Leonard Foundation, the Canada Permanent Trust Company, Toronto, Ontario, or with the Administrator of Student Awards of the University of Alberta. It is desirable that applications be filed in January as the late date for their receipt in Toronto is March 31 of each year.

Terwillegar Memorial Fund—This fund was established by Dr. Norman L. Terwillegar in memory of his only sons, Norman Allin, who was killed while serving with the British Navy, and William Robert, who served in the Royal Canadian Air Force and who died while attending Queen's University; both were former students of the University of Alberta.

The proceeds of the fund will be available to suitably qualified students in Medicine or Engineering in the form of loans, free of interest to the date of graduation. Application forms and further information may be obtained from the Deans of Medicine and Engineering.

The Alberta Dental Association Student Loan Fund. The Association has established a loan fund for undergraduate students in the Faculty of Dentistry.

Apply to the Office of the Dean of Dentistry.

The American Dental Trade Association has made available a sum of $700 annually to be issued as loans to students who have entered, or are about to enter, the final year in the Faculty of Dentistry and who require financial assistance. Application should be made to the Dean.

The Albert Strickler Memorial Loan Fund. This fund, which is administered from Philadelphia, provides for loans up to $600 for students in the Faculty of Medicine. While this is not restricted to American citizens, it may be of particular interest to any such who are studying at this University. Apply to the office of the Dean of Medicine.

Medical Class of '41 Loan Fund—A fund has been established by the Medical class of '41 from which small loans may be made at the discretion of the Dean of Medicine. Inquiries should be made at the office of the Dean of Medicine.

Kellogg Foundation Fund Loans—Through the generosity of the Kellogg Foundation of Battle Creek, Michigan, a sum of money has been made available to serve as a revolving fund to provide a limited number of loans to needy students in Medicine or Dentistry. For particulars in regard to these, apply to the Dean of Medicine or Dentistry.

The Maude Abbott Memorial Loan Fund. This fund has been established by the Federation of Medical Women of Canada. Loans up to $350 per year are available to women medical students or first year internes. A loan up to $1,000 may be granted to a medical woman for postgraduate training.

Apply to Dr. Lucille Ellison, 1207 West 40th Avenue, Vancouver, B.C.

Children of War Dead (Education Assistance) Act—This act provides fees and monthly allowances for children of veterans whose death was attributable to military service. Enquiries should be directed to the nearest district office of the Department of Veterans' Affairs.

R.C.A.F. Benevolent Fund—The Royal Canadian Air Force Benevolent Fund has made provision for loans for the benefit of former R.C.A.F. personnel or their dependents. For information apply to Mr. A. L. Robertson, P.O. Box 640, Federal Building, Edmonton, or District Superintendent, Veterans' Welfare Services, Department of Veterans Affairs, 1107 - 1st Street, S.W., Calgary.

The P.E.O. Educational Loan Fund. This is a project which makes loans available to qualified women. Loans are made for periods up to five years. The maximum loan to any student is $1,250. College seniors or graduate students may draw the full amount in one academic year. Undergraduate students may draw up to $625 for one year of study. Loans to students in summer school are limited to $400. The rate of interest is 4%. Applications for loans may be submitted and will be processed at any time during the year. Further information may be secured from the Administrator of Student Awards or Mrs. S. G. Davis, 9118 - 116 St., Edmonton.

The Harry F. Bennett Educational Fund—This loan fund has been established by members of the Engineering Institute of Canada in memory of the late Harry F. Bennett, M.E.I.C.

Loans from this fund are available to deserving students in the Faculty of Engineering who have successfully completed their first year and are in need of financial assistance. The maximum loan in any year is $250.00 and for all years $450.00.

Application forms and further information concerning this loan fund may be obtained from the Dean of Engineering.

The Association of Professional Engineers of Alberta Student Loan Fund. The Association has provided a fund from which loans may be made to students in Engineering, Geology or Geophysics. This fund is designed for emergency loans and generally students should have exhausted the other normal sources first.

Apply to the Dean of Engineering or the Head of the Department of Geology or of Physics.

UNIVERSITY OFFICER TRAINING UNITS

THE REGULAR OFFICER TRAINING PLAN

Introduction

1. The Department of National Defence, through the Regular Officer Training Plan (ROTP), sponsors a program of university education and leadership training for selected numbers of young men who have the potential to become officers in the Royal Canadian Navy, the Canadian Army, or the Royal Canadian Air Force.
2. Candidates with senior matriculation, junior matriculation, or who are university undergraduates taking suitable courses, are eligible to apply for enrolment as officer cadets in the Service of their choice. The admission standards are high, but for those who qualify, the way is open to a challenging and rewarding career. Students who are selected for the ROTP while attending university will be enrolled in the Service of their choice while continuing their university studies.
3. Training in the ROTP is divided into two parts. Cadets attend a Canadian Services College or a University throughout the academic year and then go to a unit or training establishment of their Service for training each summer.

Academic Training

4. In general terms, the courses which are needed in business and industry are also required in the Armed Forces. The following are broad patterns:

   Engineering—Civil, Mechanical, Electrical, Engineering Physics, Chemical.

   Arts—General, Honors

   Science—General, Honors

   Other specialist courses which may be required by the Armed Forces. (If any course exceeds four years, the student may be accepted for his final four years only).

Conditions of Service

5. Successful applicants will be enrolled as Naval cadets in the Royal Canadian Navy, Officer cadets in the Canadian Army (Regular) or the Royal Canadian Air Force, according to their preferences. Cadets are obliged to maintain good standing academically and in military training. A cadet who fails a year, or who lacks adequate standing in a subject from a previous year, loses his benefits. On the recommendation of his faculty, he may be permitted to repeat one year at his own expense and, if successful, be re-instated.
6. An officer cadet who graduates, and has successfully completed his Service training program during the summer months, is promoted to the commissioned rank of Sub-Lieutenant in the Royal Canadian Navy, Lieutenant in the Canadian Army (Regular) or Flying Officer in the Royal Canadian Air Force (ranks are equivalent).

Financial Assistance

7. Tuition and other essential fees are paid by the Department of National Defence. Officer cadets attending university receive an allowance of $75.00 each year to purchase books and instruments.
   Scale of pay and allowances for ROTP cadets is:
   Pay, $78.00 per month on enrolment increasing to $83.00 per month after two years.
   Living allowance (university cadets only) $65.00 per month.
   Free medical and dental care is provided. Annual Leave (30 days plus travelling time) with pay and allowances may be granted each year, usually after the summer training period.

Admission Requirements

8. An applicant must have the following qualifications:
   Citizenship—be a Canadian citizen or a British subject resident in Canada with the status of a landed immigrant.
   Marital Status—be single and remain so until commissioned.
   Medical—be physically fit for enrolment in the Service of his choice.
   Age—have reached his 16th birthday, but not his 21st birthday on the first of January of the year of entrance if applying with senior matriculation; or his 20th birthday if applying with junior matriculation. Consent of a parent or guardian is required if he is under 18 years of age.

How to Apply

9. Application should be made through the Commanding Officer of the university unit on campus, or through the Resident Staff Officer.

Medical Subsidization Plan

Scope

10. This plan provides for subsidization of medical students during the final three years of university and the interne year. Application may be made at any time after the commencement of the third from last academic year up to the end of the interne year.

Status

11. Applicants are enrolled in their initial years as Officer cadets (or equivalent). On successful completion of the first academic year under the plan, and the following summer, the student is promoted to Second Lieutenant or equivalent).

Benefits

12.

	As Officer Cadet	As Second Lieutenant Single	As Second Lieutenant Married
Pay of Rank	$ 78 to $ 83 per mon.	$250 per mon.	$250 per mon.
Marriage Allowance	.....	.....	40 per mon.
Subsistance Allowance	65 per mon.	75 per mon.	110 per mon.
Totals	$143 to $148 per mon.	$325 per mon.	$400 per mon.

In addition all fees are paid and the student receives an allowance of $75.00 for books and instruments.

Free medical and dental care and annual leave with pay are provided.

Promotion and Terms of Service

13. After interneship and registration with a Provincial College of Physicians and Surgeons, the Officer is promoted to the rank of Lieutenant, Captain or Flight Lieutenant and will be required to serve a period of 3 years full duty.

Dental Corps Subsidization Plan

Scope

14. Dental undergraduates may apply for subsidization under this plan at any time after entering a course leading to the degree of Doctor of Dental Surgery, or upon being qualified to enter into such a course, i.e. applicants may not be enrolled until they are within 45 months of being qualified to receive a licence to practice dentistry.

Status

15. An applicant accepted under this plan will be enrolled in the Canadian Army (Regular) in the Royal Canadian Dental Corps for a fixed term in the rank of Second Lieutenant if in his penultimate or final year of his course in dentistry or, if he has not yet entered his penultimate year, in the rank of Officer Cadet.

Benefits

16.

	As Officer Cadet	As Second Lieutenant Single	As Second Lieutenant Married
Pay of Rank	$ 78 to $ 83 per mon.	$250 per mon.	$250 per mon.
Marriage Allowance	.....	.....	40 per mon.
Subsistance Allowance	65 per mon.	75 per mon.	110 per mon.
Totals	$143 to $148 per mon.	$325 per mon.	$400 per mon.

In addition all fees are paid and the student receives an allowance of $75.00 for books.

Allowance will be made for the full cost of expendable instruments and supplies for the four years, as approved by the Faculty of Dentistry.

Free medical and dental care and annual leave with pay are provided.

Promotion and Terms of Service

17. Upon successful completion of his course and obtaining his licence to practise dentistry, a candidate under this plan will be promoted as a dental officer to the rank of Captain effective 1 June of that year, and shall serve thereafter for a fixed period of five years from the date of such promotion.

University Reserve Units

General

18. The University Reserve Units are organized as sub-components of the Reserves of the three Services as follows:
    (a) Royal Canadian Navy—University Naval Training Division (UNTD);
    (b) Canadian Army—Canadian Officers Training Corps (COTC);
    (c) Royal Canadian Air Force—University Reserve Training Plan (URTP).

Role

19. The role of the University Reserve Units is:
    (a) To introduce the university undergraduates to service life so that they may make an intelligent appraisal of the advantages of a service career in one of the Regular Forces;
    (b) To provide selected university undergraduates with the training necessary to qualify them for commissioned rank in the Regular or Reserve forces; and
    (c) To engender in university undergraduates an awareness of the needs, problems and responsibilities of the Armed Forces of Canada, and an understanding of their role.

Training

20. The normal training program is divided into two theoretical and two practical phases. Selected officers of each Service will be given a third theoretical and practical phase of training. Each theoretical phase consists of 64 hours of instruction at the university during the academic year. The practical phases each consist of from 12 weeks to 15 weeks of training taken at a service school or unit of the Regular Force. This practical training in interesting fields will reinforce certain university courses and, in some cases, credits are obtained to meet university requirements.
21. During summer training the undergraduate receives Regular Force pay. Transportation, uniforms, meals, and accommodation are provided as prescribed for officers of the Regular Forces. The officer cadet also receives medical and dental care while on summer training. During the university year, undergraduates may earn up to 16 days' pay for training completed.

Commissioning

22. Upon successful completion of training, cadets are commissioned, and may be considered for service in the Regular Forces, or the Reserves.

XXIV

General Organization of the University

GOVERNING BODY OF THE UNIVERSITY OF ALBERTA

VISITOR

THE HONORABLE JOHN WALTER GRANT MacEWAN, B.S.A., M.Sc., LL.D., Lieutenant-Governor of Alberta.

The Lieutenant-Governor of the Province as representative of Her Majesty the Queen in right of the Province, is *ex officio* the Visitor of the University.

CHANCELLOR

FRANCIS PHILIP GALBRAITH, LL.D. (To August 15, 1970)

The Chancellor is elected for a term of four years by the Senate. He is chairman of the Senate, confers all degrees, and is *ex officio* a member of the Board of Governors.

PRESIDENT

WALTER HUGH JOHNS, B.A., Ph.D., LL.D., D.-ès-L.

The President is *ex officio* a member of the Board of Governors, of the Senate, of all Faculty Councils and of the Co-ordinating Council of the Universities. He presides in General Faculty Council and in other Faculty Councils when he is present. He is entrusted with the general supervision of the academic work and the business affairs of the University and of the deans, the teaching staff and the administrative staff concerned with academic work. He makes recommendations to the Board of Governors in respect of all appointments to the teaching staff and to the administrative staff of the University who are concerned with academic work and in respect of all promotions and removals of such members of the staff. When he considers this necessary he may call, and chair, meetings or joint meetings of academic councils.

THE BOARD OF GOVERNORS

JOHN EDWARD BRADLEY, M.D., Chairman. (To retire June 30, 1969).

Statutory Members

FRANCIS PHILIP GALBRAITH, LL.D., Chancellor of the University.
WALTER HUGH JOHNS, B.A., Ph.D. LL.D., D.-ès-L., President of the University.

Appointed Members

To retire May 13, 1967:
LOUIS A. DESROCHERS
MRS. M. L. McCULLOUGH
To retire June 30, 1969:
RONALD K. BANNISTER
ERNEST R. LEWIS
LUCIEN MAYNARD
DENNIS K. YORATH
HENRY KREISEL, Member of the Academic Staff
DONALD MURRAY ROSS, Member of the Academic Staff
GEORGE ROSS, Representative of the Alumni Association
His Honour Judge BRUCE C. WHITTAKER, Representative of the Alumni Association
A representative of the Senate

Secretary

JOHN MACLEAN WHIDDEN, B.Com., Bursar of the University.

The Board of Governors is a corporation with the name "The Governors of the University of Alberta". It consists of a Chairman of the Board appointed by

the Lieutenant-Governor in Council, the Chancellor, the President, and eleven other persons appointed by the Lieutenant-Governor in Council. Of the eleven, two are members of the alumni association nominated by the association; one is a member of the senate, nominated by it from those of its members who are not on the university staff; and two are members of the academic staff nominated by the general faculty council.

The conduct, management, and control of the University and all its property, revenue, business, and affairs are vested in the Board. The Board appoints the deans of all faculties, all members of the teaching staff, the Librarian, the Bursar, the Registrar, and all members of the administrative staff, but no-one may be appointed to a senior administrative post or to the academic staff of the University unless first nominated by the President of the University. The board provides for the maintenance of buildings and the erection of new buildings. It has authority to purchase and acquire such property as it may deem necessary for the purposes of the University. It fixes the various fees charged in connection with university courses and it makes financial provision for the establishment of new faculties, departments, and courses. It may establish arrangements designed to contribute to the educational and cultural advancement of the people of Alberta at large. Where any question arises as to the powers or duties of the senate or other university body or of the president or a dean or other officer or employee, and these powers and duties are not definitely provided for in the University Act, the board's decision on the question is final.

THE SENATE

Ex Officio Members

FRANCIS PHILIP GALBRAITH, LL.D. Chancellor of the University.
WALTER HUGH JOHNS, B.A., Ph.D. LL.D., D.-ès-L., President of the University
MAX WYMAN, B.Sc., Ph.D., F.R.S.C., Academic Vice-President
AYLMER ARTHUR RYAN, B.A., M.A., Provost
DARROCH DUNCAN CAMPBELL, B.Com., B.A., M.A., Director of Extension
GEORGE ROSS, President of the Alumni Association
His Honour Judge BRUCE C. WHITTAKER, Vice-President of the Alumni Association

Appointed Members

being representatives of the following bodies or of the general public:

Deans' Council
HERBERT THOMAS COUTTS, B.A., M.A., Ph.D.
WALTER CAMPBELL MacKENZIE, B.Sc., M.D., C.M., M.S., F.A.C.S., F.R.C.S.(C).

Board of Governors
ERNEST R LEWIS
MRS. M. L. McCULLOUGH

General Faculty Council
HERBERT BRUCE COLLIER, M.A., Ph.D., F.R.S.C.
ELIZABETH LOUISE EMPEY, B.Sc., Ph.D.
LEWIS GWYNNE THOMAS, M.A., Ph.D.

Alumni Association
MRS. W. B. PARSONS
HENRY TOEWS

Members of the Public Appointed by the Universities Commission
R. W. CHAPMAN
P. G. DAVIES
H. A. MacNEILL
E. G. WAHLSTROM
R. J. ZENDER

Students' Council
B. SCHEPANOVICH
J. F. VANELDIK

Thirty representative members, yet to be appointed.

Acting Secretary

ALEXANDER DUNCAN CAIRNS, B.A., Edmonton, Registrar of the University

The Senate of the University consists of the Chancellor, who is chairman; the President; the academic Vice-President; the chief academic officer for student affairs; the Director of Extension; the president and the vice-president of the alumni association; two deans, to be appointed by the deans' council; two members of the board to be appointed by the board; three members of the general faculty council, to be appointed by the council; two members of the alumni association, to be appointed by the association; five members of the public, to be appointed by the Universities Commission; two students, to be appointed by the students' council; and thirty representative members, to be elected by the *ex officio* and appointed members to represent affiliated colleges or institutions, geographical areas and groups and organizations with an interest in the university.

It is the duty of the senate to inquire into any matter that might tend to enhance the usefulness of the university. It is specifically authorized to require reports from faculty and school councils, the students' council and any members of the academic staff; to receive and consider submissions from anyone interested in the university; to arrange for public meetings, radio and television programs and other means of providing and acquiring information on the university; as a consequence, to make reports and recommendations to the board or the general faculty council or the universities commission or the co-ordinating council. It may authorize the conferring of honorary degrees.

THE ACADEMIC VICE-PRESIDENT

He is the senior vice-president; in the absence or incapacity of the president or when the presidency is vacant, he is the acting president. He is *ex officio* a member of the Co-ordinating Council of the Universities and of the Senate.

THE DEANS' COUNCIL

The Deans' Council, consisting of the President, the Vice-Presidents, the Deans of all the Faculties and such other officers as the Council may designate, has advisory functions.

GENERAL FACULTY COUNCIL

President Johns

Vice-President Wyman

Deans—Bentley, Bowker, Coutts, Hardy, Harries, Huston, McCalla, MacKenzie, MacLean, Ross, Smith, Van Vliet

Professors—G. L. Berry, R. V. Blackmore, D. D. Campbell, H. B. Collier, W. G. Corns, E. E. Daniel, R. S. Eaton, E. L. Empey, J. W. Gilles, E. J. H. Greene, L. C. Green, W. E. Harris, H. Kreisel, T. S. Leeson, F. V. MacHardy, C. H. Moore, G. L. Mowat, J. R. Nursall, T. H. Patching, G. B. Peacock, D. Quon, A. W. Reeves, B. E. Riedel, A. A. Ryan, W. A. S. Smith, W. D. Smith, W. N. Stewart, L. G. Thomas, L. H. Thomas, A. R. Thompson, W. C. Wonders, W. H. Worth

Associate Professors—D. D. Betts, R. J. Buck, D. F. Cameron, G. L. Duggan, R. E. McClure, J. MacGregor, L. E. MacLeod, J. Sanders, B. C. Williams, K. V. Wilson

Assistant Professors—L. G. Allbon, M. Berry, D. G. Cameron, M. T. F. Carpendale, T. C. Pocklington, S. Tretiak, G. D. Williams, T. Yamamoto

Mr. B. B. Peel, Librarian

Secretary—A. D. Cairns

The General Faculty Council consists of the President, the Vice-Presidents, the Deans, the Directors of Schools, the Librarian, the Director of Extension, the Registrar, elected members representing the faculties and the schools that have school councils, and members appointed by the *ex officio* and elected members. The number of elected members is twice that of the *ex officio* members; the number of appointed members is decided by the *ex officio* and elected members. The General Faculty Council, subject to the authority of the Board of Governors, is the senior academic body of the University at Edmonton. It arranges timetables, approves courses and examination results, provides for the granting and conferring of degrees, and hears appeals by students and others from decisions of Faculty Councils. Subject to the approval of the Universities Co-ordinating Council in the case of first-year students, it determines standards and policies respecting admission of students. It may make recommendations to the board on affiliation of other institutions and any other matter which it considers to be of interest to the university. It may authorize a school to have a council of the nature of a faculty council, and may withdraw the authorization. It has the general supervision of student affairs.

Faculty Councils

Each faculty, except that of Graduate Studies, has a Council consisting of the President, the Dean of the Faculty, all full-time members of the academic staff of the faculty, a representative of each of the appropriate professional societies associated with the university appointed by the General Faculty Council on the recommendation of the society, and other persons appointed by the General Faculty Council on the recommendation of the Faculty Council. Each school so authorized by the General Faculty Council may have a similar council. The Council of the Faculty of Graduate Studies consists of the Dean, the President and other persons appointed by the General Faculty Council.

Each Faculty Council, subject to the control of the General Faculty Council, arranges the courses of study falling within its jurisdiction and provides for the setting of examinations and for determining the results. It deals with admissions and withdrawals and authorizes the granting of degrees *in course* in bracnhes of learning within its jurisdiction.

The names of persons appointed by the General Faculty Council, and of the representatives of professional societies, are set out below.

Agriculture

No appointments have yet been made.

Arts

The Registrar

Business Administration and Commerce

No appointments have yet been made.

Dentistry and Dental Hygiene

No appointments have yet been made.

Education

No appointments have yet been made.

Engineering

Dr. D. R. Stanley, representative of the Association of Professional Engineers of Alberta

Graduate Studies

Th Associate Dean, and one representative of each department offering a substantial amount of graduate work.

Household Economics

No appointments have yet been made.

Law

Mr. B. V. Massie, representative of the Law Society of Alberta

Medicine

Dr. W. Bramley-Moore, representative of the College of Physicians and Surgeons of Alberta

Nursing

Dean MacKenzie

Professor—Nettler

Associate Professors—Goodwin, Holmes

Assistant Professor—Ratsoy

Mrs. Sabin, representative of the Alberta Association of Registered Nurses

Miss M. G. Purcell, Director of Nursing, University Hospital

Dr. B. Snell, Executive Director, University Hospital

Pharmacy

W. W. Maday, representative of the Alberta Pharmaceutical Association

Physical Education

Professors—Porteous, D. B. Scott, W. A. S. Smith

Associate Professors—Eyford, Knowles, Purvis, Sproule

The Registrar

Rehabilitation Medicine

Dean MacKenzie

Associate Dean Cameron

Professors—Nursall, Shacter (or delegate), Yonge (or delegate)

Associate Professors—Monckton, Rempel

Assistant Professors—E. O. Hagen, Orrell, Mielke

Lecturers—Fowler, Kidd

Instructors—P. B. R. Allen, R. S. Henderson

Miss S. Reich, representative of The Canadian Physiotherapy Association

Representative of the Canadian Association of Occupational Therapists

Representative of the Faculty of Education

The Registrar or his delegate

Science

No appointments have yet been made

ADMINISTRATIVE OFFICERS

President of the University—Walter Hugh Johns, B.A., Ph.D., LL.D., D.-ès-L.

Vice-President (Academic)—Max Wyman, B.Sc., Ph.D., F.R.S.C.

Provost and Executive Assistant to the President—Aylmer Arthur Ryan, B.A., M.A.

Executive Assistant to the Vice-President—Bernard Edward Riedel, M.Sc., Ph.D.

Assistant to the President—Brian Hugh McDonald, B.Com., M.B.A.

Dean of the Faculty of Arts—Douglas Elstow Smith, M.A., Ph.D.

Assistant Deans—Roger George Motut, B.A., M.A., B.Ed., and James William Fishbourne, B.Com.

Dean of the Faculty of Science—Donald Murray Ross, M.A., Ph.D.

Associate Dean—Kenneth Bateman Newbound, M.Sc., Ph.D.

Assistant Dean—Reginald Charles Jacka, B.Sc., S.M.

Dean of the Faculty of Law—Wilbur Fee Bowker, Q.C., B.A., LL.B., LL.M.

Dean of the Faculty of Engineering—Robert Macdonald Hardy, B.Sc., M.Sc., D.Sc., F.R.S.C., F.E.I.C.

Associate Dean—Leonard Eustace Gads, B.Sc.

Dean of the Faculty of Medicine—Walter Campbell MacKenzie, B.Sc., M.D., C.M., M.S., F.A.C.S., F.R.C.S.(C.).

Associate Dean—Donald Forbes Cameron, M.B.E., B.A., M.D.

Dean of the Faculty of Agriculture—Charles Fred Bentley, M.Sc., Ph.D.

Dean of the Faculty of Education—Herbert Thomas Coutts, B.A., M.A., Ph.D.

Associate Dean—Wilfred Pilkington, M.A., B.Ed.

Dean of the Faculty of Dentistry—Hector Robert MacLean, D.D.S., F.A.C.D., F.I.C.D.

Assistant to the Dean—Clarence W. B. McPhail, B.Sc., D.D.S., M.S.D., F.I.C.D.

Dean of the Faculty of Pharmacy—Mervyn James Huston, M.Sc., Ph.D.

Dean of the Faculty of Graduate Studies—Arthur Gilbert McCalla, B.Sc., M.Sc., Ph.D., F.R.S.C., F.A.I.C.

Associate Dean—Eric John Hanson, B.A., M.A., Ph.D.

Dean of the Faculty of Commerce—Hubert William Harries, B.Sc., M.Sc., M.A., Ph.D.

Dean of the Faculty of Physical Education—Maurice Lewis Van Vliet, B.S., M.S., Ed.D.

Director of the School of Nursing—Ruth Elizabeth McClure, B.Sc., M.P.H., R.N.

Director of the School of Household Economics—Elizabeth Louise Empey, B.Sc., M.N.S., Ph.D.

Director of the School of Rehabilitation Medicine—Michael Trevor Falls Carpendale, M.R.C.S., L.R.C.P.

Director of the School of Dental Hygiene—Margaret Helen-Marie Berry, B.Sc.

Director of Extension—Darroch Duncan Campbell, B.Com., B.A., M.A.

Assistant Director of Extension—Glen Allenby Eyford, B.A., M.A.

Director of the Summer Session and of the Evening Credit Program—John William Gilles, M.A., M.Ed., Ed.D.

Director of Student Counselling Services—Arthur John Bates Hough, M.A., L.Th.

Counsellors—Peter P. Rempel, B.A., B.Ed., Ph.D., Allen Richard Vander Well, M.A., Mrs. Rosalyn Delehanty, B.A.

Dean of Women—Mrs. J. Grant Sparling, B.A., Dip.S.W.

Assistant to the Dean of Women—Mary Richardson, B.Sc., P.Ed., M.Ed.

Librarian to the University—Bruce Braden Peel, M.A., B.L.S.

Registrar of the University—Alexander Duncan Cairns, B.A.

Associate Registrar—Lynn Parkes Morgan, B.A.

Assistant Registrar—William Alexander Douglas Burns, B.A.

Alumni Secretary—Alexander Gilmour Markle, B.A., B.J., B.Ed., M.Ed.

Bursar of the University—John MacLean Whidden, B.Com.

Chief Accountant—Murray Alexander Rousell, B.Com., C.A.

Purchasing Agent—Edward Frederick Hunter, B.Com.

Accountants—Albert Stephen Knowler, B.Com., Delmar Perry Brooks, B.Com., C.A.

Director of Student Health Services—James Frank Elliott, B.A., M.D., F.R.C.P.(C.) F.A.C.P.

Associate Director of Food Services—Mrs. Evelyn Myrta McGibbon, B.Sc.

Dietitian, Cafeteria—Eleanor Grace Cairns, B.Sc.
Dietitian, Residences—Margaret Gibbard, B.Sc.
Assistant Dietitian, Residences—Venita Semchischen, B.Sc.
Personnel Officer—Murray Stewart Cooke, B.S.A.
Superintendent of Buildings—Ronald Edward Phillips, B.Sc.
Superintendent of Grounds—Robert Hugh Knowles, B.S.A., M.Sc.
Campus Development Officer—J. R. B. Jones, D.S.O., O.B.E., C.D., B.Sc.
Administrator of Student Awards—Robert Barry Wishart, B.Com.
Student Awards Officer—Gordon P. Myers
Dean of Men—Roland Charles Wilkins Hooper, Major, Dip.R.M.C., p.s.c.
Assistant Dean of Men—Stanley Robert Munro, M.A.
Co-ordinator of Technical Services—
Director of Food and Housing (Acting)—Derek Bone

ACADEMIC STAFF

INSTRUCTIONAL AND ADMINISTRATIVE

Compiled June 1966

(The first of the dates in each case is that of first appointment, and the second that of attaining the present rank.)

AARON, Theodore Herschel, BSc MD (Alberta), Lecturer in Medicine (1952, 1952).

ABRAHAMSON, Kurt-Viking, Fil Lic (Helsinki), Assistant Professor of Geography (1963, 1963).

ABU-LABAN, Baha R., BA MA (American University, Beirut), PhD (Washington), Assistant Professor of Sociology (1961, 1961).

ADAMS, Peter Frederick Gordon, BEng MEng (N.S. Tech. College), Associate Professor of Civil Engineering (1960, 1966).

AFFLECK, Alan Ferguson, BPHE (Toronto), BEd (Alberta), Associate Professor of Physical Education (1951, 1962).

AFFLECK, Muriel Adeline, MEd (Alberta), Associate Professor of Elementary Education (1949, 1957).

ALDERMAN, Richard B., MPE (British Columbia), EdD (Berkeley), Assistant Professor of Physical Education (1965, 1965).

ALLARD, Charles Alexander, MD (Alberta), FRCS(C) FACS, Assistant Clinical Professor of Surgery (1951, 1964).

ALLBON, Leonard George, Teaching Diploma AOT (London), Assistant Professor of Occupational Therapy (1960, 1961).

ALLEN, Peter B. R., BSc MD (Alberta), FRCS(C), Instructor in Surgery (1964, 1965).

ALLEN, Willard Finlay, BSc (W. Ontario), MA PhD (Toronto), Associate Professor of Chemistry (1948, 1954).

ALLIN, Eardley Samuel, BSc (Alberta), MD (Toronto), FRCS (London), FRCS(C), Instructor in Surgery (1941, 1947).

ALLIN, George Edgar, BSc MD (Alberta), FRCS (England), Sessional Instructor in Surgery (1960, 1960).

AL-SALAM, Mrs. Nadkla Abdul-Halim, BA (Baghdad), PhD (Duke), Assistant Professor of Mathematics (1966, 1966).

AL-SALAM, Waleed A., BS MA (Berkeley), PhD (Duke), Associate Professor of Mathematics (1966, 1966).

ALTON, John Douglas McGregor, MSc MD (Alberta), Lecturer and Head of Plastic Surgery (1959, 1965).

ANDERSON, Arthur James, BSc (Alberta), MS PhD (Washington), Professor of Pharmacy (1949, 1965).

ANDERSON, Charles Campbell, MA EdB (Glasgow), PhD (Cambridge), Professor of Educational Psychology (1957, 1963).

ANDERSON, D. T., BA (Manitoba), BA BCL (Oxford), Assistant Professor of Law (1962, 1962).

ANDERSON, Kenneth Owen, BSc MSc (Alberta), Associate Professor of Civil Engineering (1957, 1962).

ANDERSON, Miss Ruby Olga, MEd (Alberta), Associate Professor of Physical Education (1956, 1961).

ANDERSON, Walter Stirling, BSc (Alberta), MS MD (Toronto), FRCS(C) FACS, Professor of Surgery (1941, 1956).

ANDREW, William Treleaven, BSc (Alberta), MS (Utah State), PhD (Michigan), Associate Professor of Horticulture (1959, 1959).

ANSARI, AMIR HOUSHANG, MD (Tehran), Sessional Lecturer in Obstetrics and Gynaecology (1966, 1966).

AOKI, Tetsuo, BCom (British Columbia), BM MEd (Alberta), Assistant Professor of Secondary Education (1965, 1965).

APEDAILE, Leonard Peter Petry, B.Sc. (McGill), Assistant Professor of Agricultural Economics (1966, 1966).

ARCHER, Miss Violet, BMus (McGill), BMus MMus (Yale), Associate Professor of Music (1962, 1962).

ARMSTRONG, Heman Brock, MD (Alberta), Assistant Clinical Professor of Paediatrics (1950, 1959).

ARMSTRONG, Robert David, BEd BA MEd (Alberta), EdD (U.C. Berkeley), Associate Professor of Elementary Education (1962, 1964).

ARMSTRONG, William Sloane Seale, MD CM (McGill), Assistant Clinical Professor of Otolaryngology (1931, 1955).

ATKINSON, Thomas Page, BSc, BEd (Alberta), Assistant Professor of Elementary Education (1965, 1965).

AUSTIN, Miss Patricia Louise, BPHE (Toronto), MA (Columbia), Professor of Physical Education (1947, 1966).

AUXIER, Miss Margaret Virginia, BA (Alberta), BA in Lib (Washington), Reference Librarian (1961, 1963).

AYER, William Alfred, BSc PhD (New Brunswick), FCIC, Associate Professor of Chemistry (1958, 1963).

BAADSGAARD, Halfdan, BS (Minnesota), PhD (Federal Inst., Zurich), Professor of Geology (1957, 1966).

BACON, Hugh MacRae, BSc (Mount Allison), MD (Dalhousie), Clinical Instructor in Psychiatry (1966, 1966).

BAILEY, Arthur Wesley, BSc (British Columbia), MSc (Oregon State), Assistant Professor of Plant Science (1966, 1966).

BAIN, Gordon Orville, BSc MD (Alberta), Associate Professor of Pathology (1952, 1960).

BAIRD, Richard Edward, BA (Augustana), MA PhD (Illinois), Associate Professor of Political Science (1960, 1965).

BAKKER, Jaap Jelle, BSc (Glasgow), MSCE (Purdue), Associate Professor of Civil Engineering (1959, 1962).

BALDWIN, Robert George, BA (British Columbia), MA PhD (Toronto), Professor of English (1951, 1963).

BALL, George Eugene, AB PhD (Cornell), MS (Alabama), Professor of Entomology (1954, 1965).

BALLAH, Allan J., BEd MA (Alberta), Assistant Professor of French (1964, 1966).

BANCROFT, Donald Asa, BSc MA (Alberta), Associate Professor in Department of Extension (1958, 1963).

BARAGAR, Francis Alvin, MSc (Manitoba), PhD (Brandeis), Assistant Professor of Mathematics (1962, 1962).

BARCLAY, Harold, BA (Boston), MA PhD (Cornell), Associate Professor of Anthropology (1966, 1966).

BARR, James Stevenson, MB ChB (Glasgow), FRCOG FRCS(C), Instructor in Obstetrics and Gynaecology (1958, 1963).

BARRY, Douglas Dennis, AOCA (Ontario College of Art), Extension Assistant Professor of Art (1960, 1963).

BARTELL, Marvin, BA (McGill), Assistant Professor of Business Administration and Commerce (1965, 1965).

BARTELL, Mrs. Rivkah, MA (Hebrew University, Jerusalem), Assistant Professor of Educational Psychology (1966, 1966).

BARTON, Peter G., BSc PhD (Liverpool), Assistant Professor of Biochemistry (1966, 1966).

BASARABA, Neil, DDS (Alberta), Lecturer in Dentistry (1958, 1958).

BAUER, Milton Frank, BA (W. Ontario), MA (Toronto), Associate Professor of Economics (1956, 1964).

BAY, Christian, LLB PhD (Oslo), Professor and Head of Political Science (1965, 1965).

BEATTY, David Delmar, BA (West Washington State College), MS (Wyoming), Assistant Professor of Zoology (1964, 1964).

BEAUCHAMP, Louis Emile, MSc MD (Alberta), Lecturer in Paediatrics (1951, 1955).

BECK, Roland Peter, MD CM (Queen's), FRCS(C) FRCOG FACOG, Professor and Head of Obstetrics and Gynaecology (1965, 1965).

BEDNARSKI, Mrs. Hanna Jadwiga, MPhil (Warsaw), BLS (McGill), Library Assistant (1962, 1962).

BELL, David MacPherson, BA MD (Alberta), Instructor in Medicine (1953, 1953).

BELL, Donald Munns, MD (Alberta), FRCS(C) FACS, Lecturer in Obstetrics and Gynaecology (1951, 1955).

BELL, Gordon Irving, BA MD (Alberta), FACP, Lecturer in Medicine (1945, 1950).

BELL, Harold Edwin, BSc MD (Alberta), Professor of Pathology, Sessional Instructor in Biochemistry and Director, Divisian of Medical Laboratory Science (1957, 1966).

BELL, Robert Edward, MD (Alberta), Associate Professor of Pathology and Honorary Lecturer in Medicine (1950, 1962).

BELLOW, Donald Grant, BASc (Brit. Columbia), MSc PhD (Alberta), Associate Professor of Mechanical Engineering (1963, 1966).

BENTLEY, Charles Fred, MSc (Alberta), PhD (Minnesota), Professor of Soil Science and Dean of Agriculture (1946, 1959).

BENTLEY, Mrs. Helen Signe, MSc (Iowa State), Associate Professor of Household Economics (1947, 1966).

BERCOV, Ronald, MSc (Alberta), PhD (California IT), Assistant Professor of Mathematics (1963, 1963).

BERG, Eric Richard, MA (Texas), MS PhD (Illinois), Associate Professor of Economics (1962, 1962).

BERG, Roy Torgny, BSc (Alberta), MS PhD (Minnesota), Professor of Animal Science (1950, 1963).

BERGEN, John Jacob, BSc BEd MEd (Manitoba), Assistant Professor of Education (1965, 1965).

BERGMANN, John Francis, AB PhD (California), MA (Texas), Associate Professor of Geography (1960, 1963).

BERRY, Gerald Lloyd, BEd MA (Alberta), EdD (Colorado), Professor and Head of Secondary Education (1961, 1966).

BERRY, Miss Margaret Helen-Marie, BSc (Mount Allison and Columbia), Assistant Professor and Director, School of Dental Hygiene (1961, 1961).

BERST, Charles A., BA (Washington), Assistant Professor of English (1965, 1965).

von BERTALANFFY, Ludwig, PhD (Vienna), Professor of Theoretical Biology (1961, 1962).

BERTRAM, Ewart G., BA MSc (W. Ontario), PhD (Buffalo), Associate Professor of Anatomy (1961, 1961).

BERTRAM, Sheila, BSc (McMaster), BLS (Toronto), Library Assistant (1964, 1964).

BESNEY, Morris, BSc MD (Alberta), Instructor in Surgery (1958, 1959).

BESSAI, Mrs. Diane Elizabeth, BA (W. Ontario), MA (London), Associate Professor of English (1961, 1966).

BESSAI, Frank MA (Saskatchewan), PhD (Toronto), Associate Professor of English (1960, 1966).

BEST, Miss Barbara Jane, BSc (Carleton), Instructor in Clinical Pathology (1956, 1956).

BETTS, Donald Drysdale, MSc (Dalhousie), PhD (McGill), Professor of Physics (1956, 1966).

BHATIA, Avadh Behari, MSc DPhil (Allahabad), PhD (Liverpool), FRSC, Professor of Physics and Director of the Theoretical Physics Institute (1955, 1965)

BHATTACHARYYA, Nirmal Chandra, MA LLB (Calcutta), MA (Chicago), PhD (Australian National University), Associate Professor of Educational Foundations (1965, 1965).

BICKNELL, John Evans, BSc BED (Alberta), MSc PhD (Iowa State), Associate Professor of Educational Psychology (1966, 1966).

BIGG, Walter Lionel, BSc (Alberta), Associate Professor of Civil Engineering (1957, 1960).

BILSLAND, John Winstanley, MA (British Columbia), PhD (Toronto), Associate Professor of English (1955, 1963).

BIRSS, Fraser William, MA (Saskatchewan), DPhil (Oxford), Associate Professor of Chemistry (1959, 1963).

BISHOP, Jay Kay, MA (Sacramento State College), Associate Professor of Educational Psychology and Elementary Education (1966, 1966).

BISSELL, Erwyn W., BSc MD (Alberta), Instructor in Surgery (1961, 1964).

BLACK, William Robert, BSc MD (Alberta), FRCP(C), Instructor in Medicine (1962, 1964).

BLACKLEY, Frank Donald, MA PhD (Toronto), Professor of History (1950, 1959).

BLACKMORE, Robert Valentine, DDS (Alberta), PhD (Rochester), Professor of Operative Dentistry (1948, 1962).

BLANCHARD, William August, MA PhD (Oregon), Assistant Professor of Psychology (1961, 1961).

BLENCH, Thomas, BSc (Glasgow), DSc (Alberta), MICE, Professor of Civil Engineering (1948, 1954).

BLODGETT, Edward Dickinson, BA (Amherst), MA (Minnesota), Assistant Professor of English and Romance Languages (1966, 1966).

BOAG, David Archibald, MSc (Alberta), Assistant Professor of Zoology (1963, 1963).

BOCIURKIW, Bohdan Rostyslaw, MA (Manitoba), PhD (Chicago), Associate Professor of Political Science (1956, 1961).

BOERSMA, Frederick J., BS MA (W. Michigan), PhD (Michigan State), Assistant Professor of Educational Psychology (1965, 1965).

BOILEAU, George René, BSc MD (Alberta), FRCS(C), Lecturer in Surgery (1952, 1965).

BONDAR, George Frederic, MSc (Manitoba), MDCM (McGill), FRCS(C), Instructor in Surgery (1964, 1964).

BOODRAM, Mrs. Cynthia Aspasia Lynn, BA (Saskatchewan), Instructor in Medical Laboratory Science (Pathology) (1966, 1966).

BORHEK, James T., AB (Illinois), MA (California), PhD (Oregon), Assistant Professor of Sociology (1962, 1962).

BORKENT, Albert, Dip (Utrecht, Holland), DDS (Alberta), Sessional Lecturer in Dentistry (1961, 1961).

BOSLEY, Richard N., AB (Utah), MA (Berkeley), Assistant Professor of Philosophy (1964, 1965).

BOUTHILLIER, Patrick Henry, BSc (Alberta), SM (Harvard), Professor of Civil Engineering (1947, 1965).

BOUWMANN, Henry W., BSc MD (Alberta), Sessional Instructor in Surgery (1964, 1964).

BOWEN, Peter, MD (Toronto), FRCP(C), Associate Professor of Human Genetics, Department of Paediatrics (1964, 1964).

BOWERS, Kenneth L., BA (Central Washington College), MA PhD (New York), Assistant Professor of Secondary Education (1966, 1966).

BOWKER, Wilbur Fee, QC BA LLB (Alberta), LLM (Minnesota), Dean of Law (1945, 1948).

BOWLAND, John Patterson, BSA (Manitoba), MS (Washington), PhD (Wisconsin), Professor of Animal Nutrition (1949, 1962).

BOYD, David William, BSc (Carleton), MA (Toronto), Assistant Professor of Mathematics (1966, 1966).

BOYD, John Angus, BA (Saskatchewan), MD (Manitoba), FRCS(C) FACOG, Lecturer in Obstetrics and Gynaecology (1954, 1958).

BOYD, Thomas Alexander Somerville, MB ChB (Glasgow), FRCS (England), Associate Professor of Ophthalmology and Director, Division of Ophthalmology, Department of Surgery (1958, 1964).

BRABEN, Donald W., MSc PhD (Liverpool), Assistant Professor of Physics (1962, 1962).

BRADSHAW, Miss Ruth O. F., DipPT (Toronto), TeachDip (Toronto), BSc (PaedOT) (McGill), Assistant Professor and Head, Division of Physical Therapy (1962, 1962).

BRAMLEY-MOORE, William, MD (Alberta), Lecturer in Medicine (1949, 1949).

BRANT, Charles Sanford, BA (Reed), MA (Yale), PhD (Cornell), Associate Professor of Anthropology (1961, 1963).

BRAUN, Richard E., AM (Michigan), Assistant Professor in Classics (1962, 1964).

BRODER, Miss Audrey Marie, BA (Alberta), AMLS (Michigan), Library Assistant (1965, 1965).

BRODIE, Harold Johnson, MSc (Manitoba), PhD (Michigan), Professor and Head of Botany (1957, 1957).

BROOKER, Elmer Whitmore, MSc (Alberta), PhD (Illinois), Associate Professor of Civil Engineering (1958, 1964).

BROOKS, Delmar Perry, BCom (Saskatchewan), CA, Accountant (1961, 1963).

BROOME, Thomas Paul, MD CM (Queen's), FRCP(C), Instructor in Clinical Medicine (1964, 1964).

BROSCOE, Andy Joe, BS (Mount Union, Ohio), AM (Oberlin), PhD (Columbia), Assistant Professor of Geology (1964, 1964).

BROWN, Gordon David, BSc MD (Alberta), Instructor in Medicine (1954, 1954).

BROWN, Leigh Borrodell, BSc MD (Alberta), FRCS(C), Instructor in Obstetrics and Gynaecology (1957, 1963).

BROWN, Robert Karl, MSc (Alberta), PhD (McGill), Professor of Chemistry (1946, 1960).

BRUCE, William John, BEd (Alberta), MEd (Chicago), PhD (Washington), Associate Professor of Mathematics (1958, 1959).

BRYAN, Alan Lyle, MA (Washington), PhD (Harvard), Assistant Professor of Anthropology (1963, 1963).

BRYAN, Ruth (Gruhn), AB PhD (Radcliffe), Assistant Professor of Anthropology (1965, 1965).

BUCHANAN, David Mallory, MD (Alberta), MRCOG FACOG, Instructor in Obstetrics and Gynaecology (1964, 1964).

BUCHANAN, David Meldrum, BSc (Manitoba), DDS (Alberta), Sessional Lecturer in Dentistry (1961, 1961).

BUCHANAN, Donald Ian, MB ChB (Glasgow), Lecturer in Pathology (1955, 1965).

BUCK, Robert John, BA (Alberta), MA (Kentucky), PhD (Cincinnati), Associate Professor and Head of Classics (1960, 1964).

BUCK, Walter A., DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

BUECKERT, Frank, BEd (Saskatchewan), AM (Columbia), Associate Professor of Drama 1955, 1964).

BUGIS, Joseph, BA MD (Alberta), FACOG, Lecturer in Obstetrics and Gynaecology (1954, 1962).

BURNHAM, Kay Ardell, DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

BURNS, William Alexander Douglas, BA (Alberta), Assistant Registrar (1960, 1964).

BURSEWICZ, Mrs. Anne Marjory, MB ChB (Edinburgh), DPH (Toronto), Assistant Professor of Bacteriology (1960, 1960).

BURWASH, Ronald Allan McLean, BEd MSc (Alberta), PhD (Minnesota), Professor of Geology (1965, 1965).

BURY, Robert James, MD (W. Ontario), Assistant Professor of Anatomy (1952, 1958).

BUSE, Adolf, BA (Alberta), Assistant Professor of Economics (1966, 1966).

BUTLER, Derril Clive, MA (Alberta), Assistant Professor of English (1966, 1966).

BUXTON, Earl William, BA BEd (Alberta), MA Washington), PhD (Stanford), Professor of Secondary Education (1948, 1959).

CAIRNS, Alexander Duncan, BA (Alberta), Registrar (1946, 1956).

CAIRNS, Andrew, MD (Alberta), Lecturer in Medicine (1952, 1964).

CAIRNS, Miss Eleanor Grace, BSc (Alberta), Cafeteria Dietitian (1944, 1944).

CALDER, James, MD (Alberta), Clinical Professor of Paediatrics (1933, 1954).

CALLAGHAN, John Carter, MS MD (Toronto), FRCS(C) FACS, Clinical Professor of Surgery (1955, 1960).

CALVERT, John Mortimer, DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

CAMERON, David Glen, AB (Princeton), Assistant Professor of Genetics (1964, 1964).

CAMERON, Donald Forbes, MBE BA MD (Alberta), Assistant Professor of Anaesthesia, Associate Dean, Faculty of Medicine (1950, 1962).

CAMERON, Donald Roy, BA MEd (Alberta), Associate Professor of Educational Psychology (1962, 1962).

CAMERON, Gordon, MD (McGill), Lecturer in Surgery (1955, 1958).

CAMERON, Robert Bruce, DDS LDS (Toronto), Sessional Lecturer in Dental Therapeutics (1946, 1946).

CAMPBELL, Darroch Duncan, BA BCom (British Columbia), MA (Alberta), Professor and Director of Extension (1949, 1956).

CAMPBELL, Donald James, BSc (Alberta), MS PhD (Purdue), Assistant Professor of Clinical Medicine (1960, 1966).

CAMPBELL, James Nicoll, BA (W. Ontario and British Columbia), MSc (British Columbia), PhD (Chicago), Associate Professor of Microbiology (1960, 1966).

CAMPBELL, Miss Margaret Murray, RN BASc (British Columbia), MPH (Michigan), Associate Professor of Nursing (1957, 1964).

CANTOR, Maxwell Mordecai, BSc MD (Manitoba), FACP, Assistant Clinical Professor of Pathology (1930, 1956).

CARD, Brigham Young, BSc BEd (Alberta), PhD (Stanford), Associate Professor of Educational Foundations (1945, 1955).

CARLTON, Terence Roy, BA (Saskatchewan), Lecturer in Slavonic Languages (1965, 1965).

CARMICHAEL, John William, MSc (Alberta), MA PhD (Harvard), Professor of Bacteriology (1954, 1966).

CARSON, Miss Audrey Marie, BEd (Alberta), Associate Professor of Physical Education (1958, 1966).

CARSON, George Donaldson, MD (Alberta), Instructor in Psychiatry (1954, 1954).

CASY, Alan Frederick, BSc PhD (London), Associate Professor of Pharmacy (1966, 1966).

CAVELL, Ronald George, BSc (McGill), MSc PhD (British Columbia), Assistant Professor of Chemistry (1964, 1964).

CHA, Karen Lynda, BA BLS (British Columbia), Library Assistant (1966, 1966).

CHAPIN, Donald Frederick, MA (Toronto), Associate Professor of English (1959, 1965).

CHARLESWORTH, Henry Alexander Kaye, MA (Cambridge), PhD (Glasgow), Associate Professor of Geology (1956, 1960).

CHARMONMAN, Srisakdi, BEng (Chulalongkorn), MSc (SEATO, Thailand), PhD (Georgia I.T.), Assistant Professor of Computing Science (1966, 1966).

CHATTEN, Leslie George, MSc (Alberta), PhD (Ohio State), Professor of Pharmacy (1961, 1965).

CHEN, Miss Rachel Jo-Chao, BS (National Taiwan), MA (Westegan, Conn.), AMLS (Peabody), Library Assistant (1965, 1965).

CHENEY, Roberta, BS (Oregon State), Lecturer in Household Economics (1966, 1966).

CHENG, Kwo Chang, BS (Cheng-Kung), MS (Kansas State), PhD (Ohio State), Associate Professor of Mechanical Engineering (1962, 1966).

CHRISTENSEN, Gustav Storm, BSc (Alberta), MASc PhD (British Columbia), Assistant Professor of Electrical Engineering (1966, 1966).

CIRILLO, Renato Publius, BA DD (Malta), Lès sci politiques (Louvain), MSc (London), Associate Professor of Economics (1966, 1966).

CLANDFIELD, Frederick, David, BEd MA (Alberta), Assistant Professor of English (1963, 1963).

CLANDININ, Donald Robert, MSA (British Columbia), PhD (Wisconsin), Professor of Poultry Nutrition (1938, 1953).

CLARE, Rupert McConnell, MD (Alberta), Lecturer in Radiology (1946, 1956).

CLARK, Marvin Altyn, BS (St. Cloud State College), MA (Minnesota), Assistant Professor of Secondary Education (1966, 1966).

CLARKE, Kenneth Andrew Connal, BSc MD (Alberta), Clinical Professor of Otolaryngology (1950, 1960).

CLARKE, Kenneth Scott, MD (Queen's), FRCS (Edinburgh), FRCS (England), Sessional Instructor in Surgery (1964, 1964).

CLARKE, Thomas Roy, MD (Alberta), FRCOG, Clinical Associate Professor of Obstetrics and Gynaecology (1941, 1963).

CLEGG, Lawrence Frank Levey, BSc (Toronto), PhD DSc DIC (London), FIBiol, Professor and Head of Dairy and Food Science (1958, 1958).

CLIFFORD, Hugh Fleming, MS (Michigan State), Assistant Professor of Zoology (1965, 1965).

CLINCH, Norman Frederick, BSc (London), Lecturer in Physiology (1965, 1965).

COFFMAN, Miss Patricia Joyce, LLB (Cumberland Law School), BA MALS (Peabody), LLM (New York), Law Librarian and Associate Professor of Law (1965, 1965).

COHEN, Maurice Herbert, MA PhD (Columbia), Associate Professor of Philosophy (1965, 1965).

COLLIER, Herbert Bruce, MA PhD (Toronto), FRSC, Professor of Pathology (1949, 1964).

COLLINSON, Donald Maurice, DDS (Alberta), Lecturer in Dentistry (1959, 1961).

COLOTELO, Nicholas, BSc (Ontario Agricultural College), MSc PhD (Saskatchewan), Assistant Professor of Plant Science (1962, 1962).

COLTER, Miss Carla Kathleen Alixe, BA (McGill), Assistant Professor of French (1959, 1960).

COLTER, John Sparby, BSc (Alberta), PhD (McGill), Professor and Head of Biochemistry (1961, 1961).

COMBS, Weslie, BS (California State Polytechnic), MS (Minnesota), PhD (Wyoming), Assistant Professor of Animal Science (1962, 1962).

CONGER, Miss Patricia Ruth, BSEduc (Florida State), Assistant Professor of Physical Education (1963, 1965).

CONKLIN, Miss Joan Thurber, MS (Columbia), Assistant Professor of Dental Hygiene (1965, 1966).

CONNELL, Allison Beresford, BA (Mt. Allison), D de l'U (Paris), Associate Professor of French (1965, 1965).

CONRADI, Gerhard Johann, MD (Jena), Instructor in Paediatrics (1954, 1954).

CONROY, Frederick David, MD (Alberta), Instructor in Surgery (1946, 1946).

COOK, Fred D., MSA (British Columbia), PhD (Edinburgh), Associate Professor of Soil Microbiology (1964, 1964).

COOKE, Murray Stewart, BSA (Saskatchewan), Personnel Officer (1957, 1957).

CORMACK, Robert George Hall, MA PhD (Toronto), FRSC, Professor of Botany (1936, 1957).

CORMAN, Bernard R., AB (Akron), AM PhD (Columbia), Professor of Educational Psychology (1966, 1966).

CORNS, William George, MSc (Alberta), PhD (Toronto), Professor and Head of Plant Science (1946,1961).

COSSINS, Edwin A., BSc PhD (London), Associate Professor of Botany (1962, 1965).

COSTIGAN, R. L. DDS (Toronto), Sessional Lecturer in Dentistry (1961, 1961).

COTTLE, Mrs. Merva Kathryn, MA (British Columbia), PhD (Washington), Lecturer in Physiology (1956, 1958).

COTTLE, Walter Henry, MA (British Columbia), PhD (Washington), Associate Professor of Physiology (1956, 1961).

COUTTS, Herbert Thomas, BA (Toronto), MA (Alberta), PhD (Minnesota), Professor and Dean of Education (1946, 1955).

COUTTS, Ronald Thomson, BSc ARCST PhD (Glasgow), Associate Professor of Pharmacy (1966, 1966).

COUVES, Cecil Melville, BA (Saskatchewan), MD (Manitoba), FACS, FRCS (Edinburgh), FRCS(C), Associate Professor of Surgery (1957, 1960).

CRAWFORD, Robert James, MSc (Alberta), PhD (Iillinois), Associate Professor of Chemistry (1956, 1962).

CREE, George Charles, MA (McGill), PhD (Washington, Mo.), Associate Professor of Mathematics (1957, 1959).

CREORE, Mrs. Jo-Ann Davis, AB (Lake Erie College), MA (Washington), Assistant Professor of Romance Languages (1966, 1966).

CRIGHTON, Arthur BMilgh, LRSM LRCT MusBac (Toronto), DMA (USC), Associate Professor of Music (1949, 1957).

CROCKFORD, Peter Michael, MD (Alberta), FRCP(C), Assistant Professor of Medicine (1966, 1966).

CROOKS, Hugh James, BSc MD (Alberta), DABOG FACOG, Instructor in Obstetrics and Gynaecology (1961, 1963).

CROSBY, Douglas Richard, BSc (Alberta), MA PhD (Princeton), DPhil (Oxford), Associate Professor of Mathematics (1950, 1953).

CUMMING, George Leslie, MA (Saskatchewan), PhD (Toronto), Associate Professor of Physics (1959, 1962).

CUNNINGHAM, Kenneth Robert, BA (Oregon), Assistant Professor of Sociology (1965, 1965).

CUNNINGHAM, Mrs. Rosemarie, BSc (Alberta), Instructor in Clinical Pathology (1965, 1965).

CUTLER, Mrs. Beverly Romney, BA (Utah), MS (Brigham Young), Assistant Professor of Elementary Education (1966, 1966).

DABROWSKI, Kasimietz, PhD MD (Poznan), MD (Geneva), Visiting Professor of Psychology (1965-1969).

DAFOE, Colin Scott, MD CM (Queen's), FRCS (Edinburgh), Instructor in Surgery (1952, 1952).

DAINARD, James Alan, MA BLs (British Columbia), Assistant Professor of Romance Languages (1966, 1966).

DAKIN, Mrs. Joan, BSc (Alberta), Instructor in Biochemistry (1963, 1965).

DALE, Miss Leslie Dianne, BA (Texas Tech. College), Counsellor, Student Counselling Services (1962, 1962).

DALLA LANA, Ivo Giovanni, BASc (British Columbia), MSc (Alberta), PhD (Minnesota), Associate Professor of Chemical Engineering (1957, 1960).

DANIEL, Edwin Embrey, MA (Johns Hopkins), PhD (Utah), Professor and Head of Pharmacology (1961, 1961).

DARDIER, Miss Esmé, MCSP (London), Teachers Certificate (London), Lecturer in Physical and Occupational Therapy (1963, 1963).

DARWICK, Miss Doris, BSEduc (Florida State), Assistant Professor of Physical Education (1963, 1965).

DARWISH, David, BSc (Alberta), PhD (UCLA), Associate Professor of Chemistry (1958, 1963).

DAVEY, Peter William, MD CM (Queen's), Assistant Professor of Pathology (1952, 1958).

DAVIDSON, Mrs. Katherine Maud, BSc (Alberta), Lecturer in Dentistry (1963, 1963).

DAVIES, Mrs. Mary Adam, MSW (McGill), Instructor in Psychiatry (1955, 1955).

DAVIS, Ray George, BSc MD (Alberta), MRCPS, Instructor in Surgery (1958, 1958).

DAVIS, Stuart George, MSc (Alberta), PhD (McGill), Associate Professor and Secretary of Chemistry (1942, 1958).

DAVY, Grant Robert, BA (W. Ontario), MA PhD (Fletcher School of Law and Diplomacy), Professor of Political Science (1951, 1966).

DAWSON, Wilfred Kenneth, BASc (Laval), MA PhD (Queen's), Professor and Assistant Chairman of Physics (1959, 1966).

DAWSON, William Foster, BA (Toronto), MA (Queen's), DPhil (Oxford), Associate Professor of Political Science (1958, 1964).

DAY, Frederick George, BSc MD (Alberta), MChOrth (Liverpool), FRFPS (Glasgow), Lecturer in Orthopaedic Surgery (1952, 1960).

DAY, Richard Allen, MD (Toronto), FRCS(C), Instructor in Obstetrics and Gynaecology (1964, 1964).

DAYKIN, Philip N., MA PhD (British Columbia), Visiting Assisatnt Professor of Physics (1966-1968).

DEANE, Gordon Alan, DDS (Alberta), Lecturer in Dentistry (1960, 1961).

DE LUNA, Mrs. Barbara Nelsen, BA (Washington), MA PhD (Iowa State), Assistant Professor of English (1963, 1964).

DE LUNA, Frederick A., MA PhD (Iowa State), Assistant Professor of History (1963, 1963).

DE MAN, Johannes Maria, BChemEng (Arnhem), PhD (Alberta), Associate Professor of Dairy and Food Science (1959, 1963).

DELEHANTY, John Jerome, BS (Minnesota), Assistant Professor of Economics (1962, 1962).

DELEHANTY, Mrs. Rosalyn, BA (Minnesota), Counsellor Student Counselling Services (1963, 1963).

DENHAM, Ross Allen, BCom (Alberta), Assistant Professor and Acting Secretary, Faculty of Business Administration and Commerce (1964, 1965).

DENNIS, Miss Thelma Bernice, BSc HEc (Alberta), MS (Pennsylvania State), Assistant Professor of Household Economics (1962, 1963).

DEVINE, Stewart William, BA MD (Saskatchewan), FRCS(C) FACOG, Instructor in Obstetrics and Gynaecology (1964, 1964).

DIEMERT, Miss Helen Marie, BA (St. Benedict), MA (Minnesota), Associate Professor of Elementary Education (1959, 1964).

DIMIC, Milanu, V., Dip (Belgrade), Assistant Professor of German (1966, 1966).

DINWOODIE, David Hepburn, BA (Denver), MA (Colorado), Assistant Professor of History (1966, 1966).

DIXON, Allan Alvin, BSc MD (Alberta), MS (Minnesota), Lecturer in Dermatology (1958, 1958).

DIXON, Allen E., BSc MD (Alberta), Lecturer in Medicine (1964, 1964).

DODDS, Miss Mary Isobel, BCom (Alberta), MS (Columbia), Extension Librarian (1955, 1956,).

DONNELY, Ronald Edward, DDS (Alberta), Lecturer in Dentistry (1962, 1962).

DONALD, Edwad Ferris, MD (Alberta), Lecturer in Medicine (1941, 1950).

DORFMAN, Eugene, AB (Montclair State), AM PhD (Columbia), Associate Professor of Romance Languages (1965, 1965).

DORSEY, Francis Richard James, BSc MD (Alberta), Instructor in Obstetrics and Gynaecology (1954, 1956).

DOUGALL, Robert Henry, BAct (Saskatchewan), BSc MD (Alberta), Lecturer in Medicine (1963, 1964).

DOWNS, William James, BA (Alberta), MD CM (McGill), Instructor in Medicine (1948, 1948).

DRAKE, Clare James, BPE (British Columbia), BEd (Alberta), Associate Professor of Physical Education (1958, 1966).

DRALLE, Wayne Roger, BA (Western Washington State College), MS EdD (Indiana), Assistant Professor of Secondary Education and Director of Audio Visual Media Center (1965, 1966).

DRANCHUK, Peter Michael, BSc MSc (Alberta), Associate Professor of Petroleum Engineering (1953 ,1960).

DRUGGE, Sten Erik, BA (British Columbia), Assistant Professor of Economics (1964, 1964).

DUGGAN, Miss Grace Lesley, BSc BEd (Alberta), MS (Chicago), Associate Professor of Household Economics (1931, 1953).

DUGGAN, John Winston, MD (Alberta), MMS (Tulane), FRCS(C), FACS, Associate Professor of Ophthalmology (1950, 1960).

DUKE, Charles Gavin, DDS (Alberta), Sessional Lecturer in Prosthetic Dentistry (1948, 1948).

DUNCAN, Malcolm McFarlane, BA (British Columbia), BLS (McGill), Library Assistant (1966, 1966).

DUNCAN, Neil Fraser, BSc MD (Alberta), Assistant Clinical Professor of Paediatrics (1954, 1960).

DUNFORD, Hugh Brian, MSc (Alberta), PhD (McGill), FCIC, Associate Professor of Chemistry (1957, 1961).

du PLAN, Mlle. Danièle Billion, LèsL (Lyon), DipdEtSup CAPES, Assistant Professor of French (1962, 1964).

DVORKIN, Joseph, BA MD (Alberta), Assistant Clinical Professor of Medicine (1950, 1959).

DYER, Frederick Norman, BSc (E. Michigan), MA (Michigan State), Assistant Professor of Educational Psychology (1966, 1966).

DYER, Mrs. F. N., BS (Iowa State), MA (Michigan State), Assistant Professor of Educational Psychology (1966, 1966).

EARL, Samuel Aubrey, MSc (Brigham Young), EdD MEd (Montana), Associate Professor of Educational Foundations, Director of Student Teaching (1959, 1966).

EASTERBROOK, James Arthur, MA (Queen's), PhD (London), Assistant Professor of Psychiatry, Department of Psychiatry (1961, 1963).

EASTMAN, William, AB (Oberlin), AM PhD (Brown), Assistant Professor of Philosophy (1966, 1966).

EASTWOOD, Benjamin Joseph, DDS (Alberta), Assistant Professor of Orthodontic Dentistry (1946, 1960).

EASTWOOD, Gordon Ross, BEd BA C Ed A (Western Australia), MA PhD (Minnesota), Associate Professor of Educational Foundations (1964, 1964).

EATON, Richard Stephen, LMus MusB (McGill), Professor and Head of Music (1947, 1965).

EDWARDS, Allan Manning, BSc MD (Alberta), FRCP(C), Lecturer in Medicine (1956, 1961).

EDWARD, Calvin John, DDS (Alberta), Sessional Lecturer in Dentistry (1964, 1964).

EDDY, George E., BSc MD CM (Dalhousie), FRCP(C), Instructor in Paediatrics (1961, 1961).

EDWARDS, Frank John, MD CM (McGill), Instructor in Psychiatry (1959, 1959).

EDWARDS, Glen Elmer, MD BSc (Alberta), Instructor in Surgery (1963, 1964).

EID, Thomas C., BA (Saskatchewan), MD (Toronto), FRCS(C), Instructor in Surgery (1964, 1965).

ELDER, Andrew Thomson, BA (Alberta), MA PhD (Toronto), Professor and Secretary of English (1950, 1963).

ELLIOTT, G. M., BSc (London), Specialist Dip (Carnegie College, Leeds), Assistant Professor of Physical Education (1963, 1963).

ELLIOTT, James Francis, BA MD (Alberta), FRCP(C), FACP, Director of Student Health Services and Clinical Professor of Medicine (1946, 1953).

ELLIS, Miss Margaret, Dip (Chelsea College), Teach Cert (London University), Instructor in Physical Education (1964, 1964).

ELTON, Charles Denzil Hurley, MRCS LRCP (London), DA (RCS London), DA (Canada), Instructor in Anaesthesia (1960, 1960).

ELWOOD, Ralph Carter, BA (Dartmouth), MA (Columbia), Assistant Professor of History (1964, 1964).

EMERY, Michael Albert, BSc (Alberta), MD CM (McGill), FRCS(C), Sessional Instructor in Surgery (1964, 1964).

EMPEY, Miss Elizabeth Louise, BSc (Alberta), PhD (Cornell), Professor and Director of Household Economics (1947, 1960).

ENGEL, Bernard B., BA (Allegheny College), MFA (Yale), Assistant Professor of Drama (1965, 1965).

ENGELMANN, Frederick C., AB AM (UCLA), MA PhD (Yale), Professor of Political Science (1962, 1966).

ENGLEFIELD, Colin George, BSc PhD (London), Assistant Professor of Electrical Engineering (1965, 1965).

ENGLISH, Miss Moira Latimer, BA (Brit. Columbia), MLS (Washington), Assistant Librarian, Extension (1957, 1964).

ENNS, Frederick, MEd PhD (Alberta), Professor of Educational Administration (1961, 1966).

ERIKSON, Lloyd Bernhardt, BA (Rochester), MA (Oxford), PhD (Illinois), Assistant Professor of Anatomy (1960, 1960).

ERIKSSON, Arthur William Emanuel, BSc (Alberta), MSc (Washington), Associate Professor of Physical Education (1945, 1951).

EVANS, Brian Llewellyn, BA (Alberta), PhD (London), Assistant Professor of History (1961, 1961).

EVANS, William George, MS PhD (Cornell), Associate Professor of Entomology (1958, 1961).

EYFORD, Glen Allenby, BA (Manitoba), MA (Toronto), Associate Professor and Assistant Director, Department of Extension (1960, 1963).

FAIR, Donald Clarence, BEd MA (Alberta), PhD (Minnesota), Assistant Professor of Educational Psychology (1957, 1965).

FARMER, Miss Geraldine Mary, BEd (Alberta), MA PhD (Minnesota), Associate Professor of Secondary Education (1960, 1964).

FARNELL, Mrs. Margaret Isabel Hamilton, BA (Alberta), BS in LS (Simmons College, Boston), Library Assistant (1964, 1964).

FARREHI, Cyrus, MD (Tehran), Sessional Demonstrator in Anatomy (1965, 1966).

FAUCHER, Manoel, LenDroit (Paris), MA (California), Associate Professor of French (1947, 1954).

FAULDS, Alexander Gordon, MCSP (London), Assistant Professor of Physiotherapy (1958, 1960).

FAWCETT, David MacIndoo, BSs MD (Alberta), MSc PhD (McMaster), Assistant Professor of Medicine (1964, 1964).

FEE, Alan Douglas, DDS (Alberta), MSc (Ohio State), Professor and Head of Prosthetic Dentistry (1946, 1962).

FEHLING, Jürgen, DipIng (Bergakadmie Clausthal), DrRerNat (T.H. Stuttgart), Associate Professor of Mining and Metallurgy (1965, 1965).

FELDMAN, Leonard Aaron, BBA (City College, N.Y.), MFA (Carnegie), Assistant Professor of Drama (1965, 1965).

FELTHAM, Gerald Albert, BCom (Saskatchewan), Associate Professor of Accounting 1961, 1966).

FENTON, Miss Yvonne, BA (Dunelm), ALA (England), First Assistant, Library (1954, 1964).

FERGUSON, James Hunter, MB ChB (Glasgow), Lecturer in Anatomy (1966, 1966).

FERGUSON, William Foster, BSc MD (Alberta), Assistant Professor of Obstetrics and Gynaecology (1957, 1959).

FERRATE, Juan, Lic (Barcelona), Associate Professor of Spanish (1961, 1964).

FIELD, Peggy Ann, SRN SCM (England), Dip T and S (McGill), Lecturer in Advanced Practical Obstetrics (1964, 1964).

FIFIELD, Mrs. Benita Bradley, MAOT OT Reg, Lecturer in Occupational Therapy (1963, 1965).

FILIPCHUK, Cornel E., DDS (Alberta), Lecturer in Dentistry (1962, 1962).

FILIPKOWSKI, Miss Elizabeth Helen, BEd (Alberta), Associate Professor of Elementary Education (1957, 1966).

FISHBOURNE, James William, BCom (Alberta), Assistant Dean, Faculty of Arts (1961, 1965).

FISHER, Anthony Dwight, AM PhD (Stanford), Assistant Professor of Anthropology and Educational Foundations (1965, 1965).

FISHER, Donald Grant, MSc (Saskatchewan), Associate Professor of Chemical Engineering (1964, 1966).

FLEMING, Robert Andrew, MD BSc MSc (Durham, Eng.), FICS FRCS (Edin.), LMCC, Instructor in Medicine (1964, 1964).

FLEMING, Henry Sanford Alexander, DDS (Alberta), Assistant Professor of Dentistry (1964, 1964).

FLOCK, Donald Louis, MS (Oklahoma), PhD (Texas), Professor of Petroleum Engineering (1957, 1963).

FLORENCE, Donald Eugene, DDS LDS (Toronto), Lecturer in Oral Anatomy (1946, 1952).

FOLINSBEE, Robert Edward, BSc (Alberta), MA PhD (Minnesota), Professor and Head of Geology (1946, 1955).

FORBES, John Allison, MEd (Alberta), Associate Professor of Art (1949, 1965).

FORCADAS, Alberto M., BBA (Georgia), MA (Missouri), Assistant Professor of Romance Languages (1966, 1966).

FORD, George, MSc (Alberta), PhD (Stanford), Professor and Head of Mechanical Engineering (1942, 1959).

FORD, Harvey Wilson, BE BCom (Saskatchewan), Assistant Professor of Commerce (1963, 1963).

FORREST, James French, MA BLitt (Glasgow), AM PhD (Cornell), Associate Professor of English (1960, 1964).

FOSTVEDT, Thorleif, BSc (Alberta), SM (Chicago), Associate Professor of Mathematics (1945, 1955).

FOURNIER, Lionel Joseph, BCom BA (Brit. Columbia), BSc (McGill), MA (Alberta), Assistant Professor of Physical Education (1963, 1963).

FOWLER, Eldon Lloyd, MSc (Alberta), Associate Professor of Civil Engineering (1960, 1960).

FOX, Richard Carr, AB (Hamilton College), MSc (Syracuse), PhD (Kansas), Assistant Professor of Geology and Zoology (1965, 1965).

FOX, Thomas W., BSc (Montana), Sessional Instructor in Physiology (1964, 1964).

FRACAS, Gino Mark, BA (W. Ontario), BEd (Alberta), Assistant Professor of Physical Education (1960, 1960).

FRAGA, Serafin, Lic Dr (Madrid), Associate Professor of Chemistry (1963, 1965).

FRANCIS, Robert Richardson, BA MD (Alberta), FRCS(C) FACS, Assistant Clinical Professor of Urologic Surgery (1951, 1960).

FRANCK, J. P., DipPhys DrDerNat (Hamburg), Associate Professor of Physics (1963, 1965).

FRANK, George B., BS (City College, New York), MSc (Ohio State), PhD (McGill), Professor of Pharmacology (1965, 1965).

FRASER, Mrs. Geraldine, Dip (Alberta), Instructor in Dental Hygiene (1965, 1966).

FRASER, Robert Stewart, MSc MD (Alberta), FRCP(C) FACP, Professor of Clinical Medicine (1953, 1964).

FREEMAN, Gordon R., MA (Saskatchewan), PhD (McGill), DPhil (Oxford), FCIC, Professor of Chemistry (1958, 1965).

FREIFIELD, Miss Norma Elizabeth, BA (Alberta), BLS (Toronto), Circulation Librarian (1941, 1950).

FREW, William Douglas, MB ChB (Edinburgh), FRCS(C) FACS, Assistant Clinical Professor of Obstetrics and Gynaecology (1952, 1959).

FRIEDMAN, Morris Harold Weinlos, BSC, MD, MSc (Alberta), Instructor in Surgery (1961, 1964).

FRUCHT, Richard, BA (Brooklyn), MA (Brandeis), Assistant Professor of Anthropology (1966, 1966).

FUERST, Heinrich, MD (Munich), Clinical Instructor in Psychiatry (1961, 1961).

FULLER, William Albert, MA (Saskatchewan), PhD (Wisconsin), Associate Professor of Zoology (1959, 1963).

GADS,Leonard Eustace, BSc (Alberta), Professor and Associate Dean of Engineering (1939, 1959).

GAIN, Edward Alexander, BA MD (Alberta), FACA, Professor and Head of Anaesthesia (1949, 1964).

GAINER, Walter Dunham, BSc (Alberta), MS (Iowa), PhD (Massachusetts Institute of Technology), Professor and Head of Economics (1950, 1964).

GALLAGHER, James Emmet, BEd (Alberta), Assistant Professor of Industrial and Vocational Education (1963,1963).

GANDER, Thomas Alfred, MBE MD (Alberta), Associate Clinical Professor of Paediatrics 1950, 1959).

GANS, Leo John, BSc MD (Alberta), FACOG, Instructor in Obstetrics and Gynaecology (1959, 1963).

GARFINKLE, Harry, BA (Sir George Williams), MA PhD (Columbia), Associate Professor of Educational Foundations (1966, 1966).

GARG, K. M., MSc PhD (Lucknow), Assistant Professor of Mathematics (1964, 1964).

GAUK, Ehor William, BSc MD (Manitoba), Instructor in Paediatrics (1964, 1964).

GAUNCE, Mrs. Joan Elizabeth, BSc (St. Andrews), Lecturer in Physiology (1965, 1965).

GEDDES, John Gordon, DDS (Alberta), Sessional Lecturer in Dentistry (1962, 1962).

GELDART, Stanley Gordon, DDS (Alberta), Associate Professor of Operative Dentistry (1958, 1960).

GENDRON, Joseph Edmond, BA (Sask.), MD (Toronto), FRCS(C), FACS, Sessional Instructor in Surgery (1965, 1965).

GEORGE, Pulivelil Markose, BA (Earlham), MA (Boston), PhD (North Carolina), Assistant Professor of Sociology (1965, 1965).

GIBB, George Hildon, BSc DDS (Alberta), Associate Professor and Head of Restorative Dentistry (1959, 1961).

GIBBARD, Miss Margaret, BSc (British Columbia), Dietitian, Athabasca Hall.

GIBBS, John Theodore, BA BChir MB (Cantab), Assistant Professor of Psychiatry (1962, 1964).

GILBERT, James Alan Longmore, MB ChB MD FRCP (Edinburgh), FRCP(C) MRCP (London), Professor of Clinical Medicine (1950, 1963).

GILLES, John William, MA MEd (Alberta), EdD (Stanford), Professor of Educational Psychology, Director of Summer Session and Evening Credit Program (1945, 1955).

GILSDORF, Robert Raymond, BIE (Ohio State), MA (Yale), Assistant Professor of Political Science (1964, 1964).

GINSBURG, Norman M, AM PhD (Chicago), Associate Professor of Psychology (1965, 1965).

GIROUX, Lea L., MD (Alberta), Instructor in Surgery (1963, 1963).

GLASSFORD, Robert Gerald, BPE (British Columbia), MA (Alberta), Assistant Professor of Physical Education (1965, 1965).

GODFREY, Denis Rowley, BA PhD (Dublin), Associate Professor of English (1950, 1957).

GOLA, Victor Karl, AB (Berkeley), Assistant Professor of Linguistics (1966, 1966).

GOODALE, Denis, BCom (Saskatchewan), MBA (Washington), CA RIA, Associate Professor of Accounting, Acting Head of the Division of Business Analysis (1950, 1966).

GOODING, Ronald Harry, BSc (Alberta), MA (Rice), ScD (Johns Hopkins), Assistant Professor of Entomology (1966, 1966).

GOODMAN, Yvonne Elizabeth, BSc (Alberta), Lecturer in Bacteriology and Assistant Bacteriologist, Provincial Laboratory (1959, 1965).

GOODWIN, James Williams, MD (Toronto), FRCS(C), Associate Professor of Obstetrics and Gynaecology (1964, 1964).

GOODWIN, Janette, MSc (W. Australia), Lecturer in Botany (1966, 1966).

GORDON, J. King, BTh BA (Manitoba), MA (Oxford), Professor of Political Science (1962, 1965).

GORT, John, BSc MD (Alberta), Sessional Instructor in Surgery (1964, 1964).

GOTTAAS, Paul Bjarne, DDS (Alberta), Sessional Lecturer in Dentistry (1964, 1964).

GOUD, Paul Arie, BSc (Alberta), MASc PhD (British Columbia), Assistant Professor of Electrical Engineering (1966, 1966).

GOUGH, D. Ian, MSc (Rhodes), PhD (Witwatersrand), Professor of Physics (1966, 1966).

GOURISHANKAR, Vembu, BE (Madras), MS PhD (Illinois), Associate Professor of Electrical Engineering (1965, 1965).

GRAHAM, William Arthur Grover, MA (Saskatchewan), PhD (Harvard), Associate Professor of Chemistry (1962, 1962).

GRAHAM, William Hugh, MD MCh BAO (Belfast), Instructor in Anaesthesia (1959, 1959).

GRAY, Gordon Cameron, MD (Toronto), Instructor in Surgery (1951, 1951).

GREENE, Edward Joseph Hollingsworth, MA (Alberta), DU (Paris), Professor of French and Head of Romance Languages (1938, 1953).

GREENHILL, Hon. Stanley, MD DPH (Toronto), Professor and Head of Preventive Medicine, Consulting Physician, Student Health Service (1947, 1959).

GRIEVE, Clarence Melross, BSA Dip Ed (Manitoba), Dip (ICTA, Trinidad), MSc (Manitoba), PhD (Alberta), Assistant Professor Animal Nutrition, Animal Science (1964, 1964).

GRIFFIN, Ernest George, BS AM PhD (Columbia), Associate Professor of English (1963, 1965).

GRIFFITHS, Quentin, MA PhD (Berkeley), MA (Harvard), Assistant Professor of History (1965, 1965).

GRISDALE, Lloyd Carl, MSc MD (Alberta), Professor of Community Medicine and Director of Ambulatory Care (1951, 1966).

GROSS, Fletcher Ivan, BS PhD (Cal. I.T.), Assistant Professor of Mathematics (1965, 1965).

GROUT, Miss Gail Louise, BA (Alberta), BLS (British Columbia), Library Assistant 1965, 1965).

GUE, Leslie Robb BEd (Alberta), BSW (British Columbia), Associate Professor of Educational Administration (1966, 1966).

GUILD, Julius, BSc MD (Alberta), DPM (London), Assistant Professor of Psychiatry 1957, 1963).

GULLEKSON, Clifford Leslie, DDS (Alberta), Sessional Lecturer in Dentistry (1962, 1962).

GULLEY, John Lewis, MD (Toronto), Lecturer in Orthopaedic Surgery (1959, 1964).

GULUTZAN, Metro, BA BEd (Saskatchewan), PhD (California), Associate Professor of Educational Psychology (1962, 1964).

GUNNING, Harry Emmet, MA PhD (Toronto), FRSC, Professor and Head of Chemistry (1957, 1957).

GUPTA, Ram Krishna, BSc MEd (Allahabad), MA (London), Assistant Professor of Educational Psychology (1965, 1965).

HACKLER, James Courtland, BS (Berkeley), MA PhD (San Jose State College), Assistant Professor of Sociology (1965, 1965).

HADDOW, James Baird, BSc (St. Andrews), MSc (Alberta), PhD (Manchester), Professor of Mechanical Engineering (1955, 1965).

HAGEN, Mrs. Eva Odette, MB ChB (Manchester), Assistant Pofessor of Anatomy (1961, 1961).

HAGER, Raymond B.,DDS (Alberta), Part-time Lecturer in Dentistry (1961, 1961).

HAGEN, John Martin, MB ChB (Edinburgh), Instructor in Anaesthesia (1963, 1965).

HALL, David, MSc PhD (New Zealand), Professor of Chemistry (1966, 1966).

HALL, William Francis Melville, BA MD (Alberta), FRCS(C). Assistant Clinical Professor of Surgery (1951, 1964).

HALLETT, Peter, BA BSc BM BCh (Oxon), Assistant Professor of Physiology (1965, 1965).

HAMILTON, Miss Dorothy Isabel, BA (Alberta), BSLS(Washington), AMLS (Michigan), Head of Rare Books and Archives (1929, 1964).

HAMILTON, Thomas Rochester, BSc MD (Durham), Lecturer in Preventive Medicine (1964, 1964).

HAMPTON, Alexander, BA MSc (Sydney), PhD (London), Associate Professor of Biochemistry (1963, 1963).

HANSON, Eric John, BA (Queen's), MA (Alberta), PhD (Clark), FRSC, Professor of Political Economy and Associate Dean of Graduate Studies (1964, 1964).

HANSON, Samuel, MD (Alberta), FCAP, Associate Professor of Pathology (1946, 1950).

HARDIN, Robert Toombs, BSA (Georgia), MS (Purdue), Assistant Professor of Animal Science (1962, 1962).

HARDY, Albert William, MD (Alberta), FACS FRCS(C), Assistant Clinical Professor of Surgery (1940, 1954).

HARDY, James, DDS (Alberta), Part-time Lecturer in Dentistry (1962, 1962).

HARDY, Robert Macdonald, BSc DSc (Manitoba), MSc (McGill), FRCS FEIC, Dean of Engineering (1930, 1947).

HARGREAVES, Henry Allen, MA (Mount Allison), PhD (Duke), Assistant Professor of English (1963, 1963).

HARLAND, S., MA (Leeds), FLA (England), Assistant Librarian (1959, 1960),

HARRIES, Hubert, BSc (Alberta), MA (Toronto), MS PhD (Iowa), Dean of Business Administration and Commerce (1959, 1960).

HARRINGTON, Miss Betty Nannette Nixon, BNursing (McGill), Lecturer in Nursing (1962, 1962).

HARRIS, Derald A., BSc Eng (Alberta), MBA (W. Ontario), Assistant Professor of Commerce (1963, 1963).

HARRIS, Mrs. Dorothy Jean, BA (Alberta), Lecturer in Physical Education (1965, 1965).

HARRIS, Walter Edgar, MSc (Alberta), PhD (Minnesota), Professor of Chemistry (1946, 1962).

HARWOOD, Mrs. Vivienne Joan, BSc (Exeter), Assistant Professor of Electrical Engineering (1966, 1966).

HARYETT, Rowland Dalton, DDS MSc (Toronto), Professor of Orthodontic Dentistry (1954, 1966).

HASSARD, Donald Thomas Robert, BSc MD (Alberta), Sessional Instructor in Surgery (1963, 1963).

HAWES, Harold Richard, BSc (Alberta), Graduate Registrar (1953, 1964).

HAYNES, Ernest Reginald, MA MB BCh BAO (Trinity College, Dublin), Lecturer in Community Medicine (1966, 1966).

HAYWARD, John Stanley, BSc PhD (British Columbia), Assistant Professor of Zoology (1965, 1965).

HEAD, Ivan Leigh, BA LLB (Alberta), LLM (Harvard), Associate Professor of Law (1963, 1963).

HEATH, Charles, MSc (Alberta), PhD (Minnesota), Associate Professor of Physiology (1949, 1958).

HEBB, Surgeon Commander Harvey Douglas, BSc MD CM (Dalhousie), Sessional Instructor in Surgery (1957, 1957).

HEENEY,W. Brian D., BA (Toronto), BD (Episeopal Seminary, Cambridge, Mass.), D Phil (Oxon), Assistant Professor of History (1962, 1962).

HELLON, Charles Patrick, MB ChB (Edinburgh), DPM (London), Clinical Instructor in Psychiatry (1966, 1966).

HENDERSON, Joseph Franklin, MS (Arizona), PhD (Wisconsin), Associate Professor of Biochemistry (1963, 1963).

HENDERSON, Robert Selby, MRCS (England), FRCP (London), FRCS (England), FRCS(C) FACS, Instructor in Orthopaedic Surgery (1957, 1957).

HENDERSON, Ruth McClintock, MS PhD (Minnesota), Assistant Professor of Physiology (1963, 1963).

HENDIN, Irving Donald, BSc MD (Manitoba), Lecturer in Radiology (1961, 1964).

HENDRICKSON, Miss Mary Pauline, BA BPE (Alberta), MA (Ohio State), PhD (Chicago), Assistant Professor of Sociology and Community Medicine (1966, 1966).

HERBERT, Frank Alexander, MD MSc (Manitoba), FRCP(C), Instructor in Clinical Medicine (1964, 1964).

HERMANSEN, Gustave, MA PhD (Copenhagen), Library Assistant, Assistant Professor of Classsical History ((1965, 1966).

HETT, Robert Ralph, BA (W. Ontario), Assistant Professor of History (1965, 1965).

HICKMAN, Cleveland Pendleton, BA (DePauw), MS (New Hampshire), PhD (British Columbia), Associate Professor of Zoology (1958, 1963).

HICKS, David Clark, MA BD (Glasgow), PhD (Edinburgh), Associate Professor of Philosophy (1966, 1966).

HILL, James Ross, BSP MD (Saskatchewan), Sessional Demonstrator in Clinical Pathology (1965, 1965).

HILLIARD, Joseph Ralph, MD (Toronto), FRCP(C), Assistant Clinical Professor of Medicine (1960, 1964).

HIRABAYASHI, Gordon Kiyoshi, MA PhD (Washington), Professor of Sociology and Head, Department of Sociology and Anthropology (1959, 1964).

HITCHIN, Edward, MD (Alberta), Lecturer in Surgery (1939, 1948).

HLYNKA, John Nicholas, BSc (Alberta), MSc (Philadelphia College of Pharmacy), Lecturer in Pharmacy (1963, 1963).

HNATKO, Stephen Ian, BSc MD (Alberta), MA (Toronto), Sessional Lecturer in Bacteriology (1959, 1960).

HOBART, Charles Warren, BA (Redlands), MA (S. California), PhD (Indiana), Associate Professor of Sociology (1962, 1964).

HOBBS, Brian Eric, BA (Alberta), BLS (McGill), Library Assistant (1965, 1965).

HOCKING, Brian, BSc PhD (London), MSc (Alberta), ARCSc, Professor and Head of Entomology (1946, 1956).

HODGSON, Ernest Daniel, MEd PhD (Alberta), Professor of Educational Administration (1966, 1966).

HOGGE, Harvey Leslie, BSc (Alberta), Lecturer in Preventive Medicine (1953, 1955).

HOHN, Emil Otto, MB BS MSc PhD (London), MRCS, Associate Professor of Physiology (1947, 1952).

HOLDEN, Miss Anita June, BA (London), MA (McMaster), Assistant Professor of French (1964, 1966).

HOLMES, Clarence Edward, BA MD (Alberta), Instructor in Radiology (1956, 1956).

HOLMES, John Carl, BA (Minnesota), MA PhD (Rice Institute), Associate Professor of Zoology (1959, 1964).

HOO, Cheong Seng, MSc (Auckland), PhD (Northwestern), Assistant Professor of Mathematics (1965, 1965).

HOOPER, Major Roland Charles Wilkins, Diploma of Graduation (Royal Military College), Dean of Men (1960, 1960).

HOOZ, John, BS (Brooklyn College), PhD (Purdue), Assistant Professor of Chemistry (1965. 1965).

HOPKYNS, John Creasey Wykeham, MA BM BCh (Oxford), MRCP (London), Instructor in Medicine (1953, 1953).

HORE, Terence, BEd (Alberta), Warden of the Men's Residence Hall in Lister Complex (1965, 1965).

HORNER, Ronald Hilborn, MD (Alberta), FACS DABOG FRCOG FACOG, Clinical Professor of Obstetrics and Gynaecology (1942, 1957).

HOSKINS, Colin George, BA (Manchester), Assistant Professor of Business Administration and Commerce (1966, 1966).

HOSPERS, Jan, BA (Groningen), MA (Utrecht), PhD (Cantab), Professor of Geophysics 1963, 1963).

HOUGH, Rev. Arthur John Bates, MA (W. Ontario), Licentiate in Theology (St. John's, Winnipeg), Associate Professor of Psychology, Counsellor and Director of Student Counselling Services (1955, 1964).

HOWARTH, Edgar, MSc (Manchester), PhD (Melbourne), Associate Professor of Psychology (1960, 1960).

HOWELL, Maxwell Leo, MA EdD (California), Professor of Physical Education (1961, 1963).

HUCKELL, John Richmond, BSc (Alberta), MD CM (McGill), FRCS(C), Instructor in Surgery (1959, 1961).

HUGHES, D. Gwyn, BSc PhD (Wales), Associate Professor of Physics (1965, 1965).

HULMES, Frederick George, MA (Alberta), Assistant Professor of Political Science (1965, 1965).

HUNKA, Stephen, MEd (Alberta), PhD (Illinois), Associate Professor of Educational Psychology and Director of Educational Research (1961, 1965).

HUNTER, Edward Frederick, BCom (Alberta), Purchasing Agent, (1948, 1948).

HUSEL, Don Harold, BSc MD (Alberta), FACOG, Instructor in Obstetrics and Gynaecology (1958, 1963).

HUSTON, Mervyn James, MSc (Alberta), PhD (Washington), FCIC, Professor and Dean of Pharmacy (1940, 1955).

HUTTON, Margaret MacSteven, BA MD (Alberta), FRCS(C) FACS FACOG, Assistant Clinical Professor of Obstetrics and Gynaecology (1944, 1957).

HYDE, Harry Alexander, MD (Toronto), FRCS(C), Instructor in Surgery (1960, 1962).

HYNAM, Charles A. S., DipICTA (Trinidad), MS PhD (Cornell), Assistant Professor of Sociology and Agricultural Economics (1962, 1966).

HYNDMAN, Charles Frederick, MD CM (Queen's), Assistant Clinical Professor of Radiology (1953, 1963).

HYRAK, Wasyl, MIuris DIuris (Ukrainian University, Munich), BLS (McGill), Library Assistant (1962, 1962).

INOUE, Fumitake, MD (Hokkaido Imperial), PhD (Tokyo), Assistant Professor Pharmacology (1965, 1965).

IRONSIDE, Robert Geoffrey, BA PhD (Durham), Assistant Professor of Geography (1963, 1963).

IRVING, David Walter, MD (Alberta), Instructor in Medicine (1965, 1965).

ISRAEL, Werner, MSc (Cape Town), PhD (Dublin), Associate Professor of Mathematics 1958, 1963).

JACKA, Reginald Charles, BSc (Alberta), SM (Chicago), Associate Professor of Mathematics and Assistant Dean, Faculty of Science (1945, 1964).

JACKSON, Dennis E., MSc PhD (Dunelm), Associate Professor of Geology (1962, 1966).

JACKSON, Francis Leslie, MRCS (Eng.), LRCP MB BS DipBact (London), Professor and Head of Bacteriology (1966, 1966).

JACKSON, Harold, MSc (Nottingham), PhD (Alberta), Assistant Professor of Dairy and Food Science (1963, 1963).

JAMES, Christopher Robert, BASc PhD (British Columbia), Assistant Professor of Electrical Engineering (1965, 1965).

JAMPOLSKY, Noel Arran, MD (Alberta), Instructor in Clinical Medicine (1964, 1964).

JESPERSEN, Reuben Edward, BA MD (Alberta), Sessional Instructor in Surgery (1956, 1956).

JOHNS, Walter Hugh, BA LLD (W. Ontario), PhD (Cornell), D-ès-L (Laval), President (1938, 1958).

JOHNSON, Denis Bruce, BA (British Columbia), MA (Alberta), Assistant Professor of Geography (1966, 1966).

JOHNSON, Eric William, BSc (London), M.Sc (Alberta), Assistant Professor of Mechanical Engineering (1958, 1958).

JOHNSON, LeRoy Peter Vernon, MSc (Alberta), PhD (Washington), Professor of Genetics (1948, 1950).

JOHNSTON, Donald Cooper, MD (Alberta), FRCS(C), Lecturer in Orthopaedic Surgery (1951, 1951).

JOHNSTON, Robert James, MD (Alberta), FRCS(C), Assistant Clinical Professor of Surgery (1953, 1956).

JONES, David Lloyd, BSc (London), PhD (Exeter), Assistant Professor of Physics (1966, 1966).

JONES, Frank Douglas, BA (Alberta), LLB (Dalhousie), LLM (Toronto), Associate Professor of Law (1966, 1966).

JONES, John Robert Blakely, DSO OBE CD BSc (Alberta), Campus Development Officer. (1963, 1963).

JONES, Melvin David, DDS (Alberta), Assistant Professor of Dentistry (1966, 1966).

JONES, Ronald Gilbert, MA (Virginia), EdD PhD (Buffalo), Associate Professor of Sociology and Educational Administration (1965, 1966).

JONES, Theodore Evan, DDS (Alberta), Part-time Lecturer in Dentistry (1963, 1963).

JONES, William J., BA PhD (London), Associate Professor of History (1961, 1965).

JORDAN, Robert B., BSc (W. Ontario), PhD (Chicago), Assistant Professor of Chemistry (1965, 1965).

JUDGE, David Lawrence Crawford, BSc MD (Alberta), FRCP(C), Assistant Clinical Professor of Medicine and Pathology.

JULIUS, Robert Stanley, MA (British Columbia), PhD (Alberta), Associate Professor and Assistant Head of Computing Science (1961, 1964).

KALANTAR, Alfred Husayn, BS (Rutgers), PhD (Cornell), Assistant Professor of Chemistry (1964, 1964).

KALBACH, Warren Edwin, MA PhD (Washington), Associate Professor and Acting Head of Sociology (1961, 1966).

KALINOWSKY, Michael, Dip (Ecole Supérieure de Commerce, Paris), Assistant Professor of French (1963, 1965).

KAMAL, Abdul Naim, MSc (Dacca), PhD (Liverpool), Assistant Professor of Physics (1964, 1964).

KANASEWICH, Ernest Raymond, MSc (Alberta), PhD (Brit. Columbia), Assistant Professor of Physics (1963, 1963).

KANE, Edward William Scott, BA LLB (Alberta), Associate Professor and Secretary of the Faculty of Law (1966, 1966).

KANTAUTUS, A., BCom (Copenhagen), MLS (Washington), Library Assistant (Orders) (1960, 1960).

KASPER, Thaddeus Alphonsus, BSc MD (Alberta), Associate Professor of Pathology 1961, 1964).

KATZ, Martin, BA (Stanford), MA (Berkeley), Assistant Professor of History (1962, 1962).

KAY, Cyril Max, BSc (McGill), PhD (Harvard), Associate Professor of Biochemistry (1958, 1961).

KEBARLE, Paul, DipIng (Zurich), PhD (British Columbia), Associate Professor of Chemistry (1958, 1963).

KELLNER, Mrs. Hazel E., BA (Saskatchewan), BLS (Toronto), Library Assistant (1963, 1963).

KELLEY, Michael Harry, MA (Wisconsin), Assistant Professor of Philosophy (1966, 1966).

KELLEY, Miss Sheila Joan, BSc (McMaster), BLS (Toronto), Library Assistant (1963 1963).

KELLY, Donald Harry, MSc (Alberta), Associate Professor of Electrical Engineering 1958, 1963).

KELLY, Thomas, BA (Penn State), AM PhD (Illinois), Assistant Professor of Classics (1966, 1966).

KEMP, Edward Wilson, BEd MA (Alberta), Assistant Professor of Philosophy (1964, 1964).

KEMPSTON, Patricia Diane, Instructor in Physical Education (1966, 1966).

KENNEDY, Henry Albert, BComm (McGill), Assistant Professor of Business Administration and Commerce (1965, 1965).

KENNEDY, James Stewart, MSc (Alberta), PhD (Stanford), Professor of Mechanical Engineering (1955, 1965).

KENNEDY, Miss Lorene Louise, MSc (Alberta), PhD (Iowa), Professor of Botany (1946, 1965).

KENNESON, Claude Emile, MMus (Texas), Assistant Professor of Music (1965, 1965).

KERR, Nancy, BHSc (Guelph), MSc (Davis), Assistant Professor of Household Economics (1966, 1966).

KHETARPAL, Suraj Parkash, BSc (Punjab), BL (Rangoon), LLM PhD (London), Associate Professor of Law (1965, 1965).

KIDD, Edward Garland, BSc MD (Alberta), Lecturer in Medicine (1952, 1957).

KILLAM, Gordon Douglas, BA (British Columbia), PhD (London), Assistant Professor of English (1965, 1965)

KIMMITT, Patrick John. BSc MD (Alberta), Instruction in Paediatrics (1958, 1958).

KING, Robert William, BSc (Alberta), Assistant Professor of Electrical Engineering (1947, 1955).

KINGMA, Ynte Jacob, Ir (Delft), Associate Professor of Electrical Engineering (1958, 1962).

KLATTE, William Frederick, MA PhD (Chicago), Associate Professor of Germanic Languages (1963, 1965).

KLAWE, Janusz J., Dipcom (Grenoble), MA (Glasgow), Associate Professor of Geography (1963, 1963).

KLING, Samuel, BA (Saskatchewan), MD (Toronto), FRCS(C) FACS, Assistant Clinical Professor of Surgery and Director of Continuing Medical Education (1951, 1964).

KNILL, William Douglas, BEd (Alberta), MA Montana State), EdD (Oregon), Associate Professor of Educational Administration (1962, 1962).

KNOWLER, Albert Stephen, BCom (Alberta), Accountant (1954, 1963).

KNOWLES, Robert Hugh, BSA (Toronto), MSc (Alberta), BSLA (Michigan State), Associate Professor of Horticulture, Grounds Superintendent (1948, 1954).

KNOWLTON, Jonathan, BA (Yale), MA (Berkeley), Assistant Professor of Art (1966, 1966).

KONCZACKI, Zbigniew Andrzej, BSc (London), BEcon (Natal), Associate Professor of Economics (1963, 1963).

KOPECKY, Karl R., BSc (Iowa), PhD (UCLA), Assistant Professor of Chemistry (1961, 1961).

KOTRC, Ronald Fred, BA (Nebraska), MA (Washingotn), Assistant Professor of Classics (1964, 1966).

KOWALEWSKI, Konstanty Piotr, MPh (Warsaw), MD PhD (Brussels), Associate Professor of Experimental Surgery (1955, 1959).

KRATZMAN, Arthur W., BEd (Saskatchewan), MEd (Alberta), PhD (Chicago), Professor of elementary Education (1966, 1966).

KREISEL, Henry, MA (Toronto), PhD (London), FIAL, Professor and Head of English (1947, 1961).

KROUSE, Roy Howard, BSc PhD (McMaster), Associate Professor of Physics (1960, 1965).

KUCEY, Stanley Stephan, DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

KUPFER, George, BA (Seattle Pacific), MA PhD (Washington), Assistant Professor of Sociology and Assistant to the Head (1964, 1964).

KUSPIRA, John, BSA MSc (Saskatchewan), PhD (Alberta), Professor and Co-Acting Head of Genetics (1955, 1966).

KUZYK, Bohdan Lew, DDS (Alberta), Sessional Lecturer in Dentistry (1961, 1961).

KUZYK, Victor Cecil, DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

LA ROI, George Henri, BA (Lake Forest College), MA PhD (Duke), Assistant Professor of Botany (1963, 1963).

LA TERREUR, Marc, BA (Montreal), L-ès-L (Laval), Assistant Professor of History 1964, 1964).

LAKEY, William Hall, BSc MD (Alberta), FRCS(C), Associate Professor of Surgery (1960, 1964).

LAMPARD, Miss Dorothy, BA (Manitoba), MA (Chicago), PhD (Oregon), Associate Professor of Elementary Education (1952, 1957).

LANE, Arnold H., DDS (McGill), Lecturer in Dentistry (1962, 1962).

LANE, Byron George, BA PhD (Toronto), Associate Professor of Biochemistry (1961, 1964).

LARSEN, Donald Erik, BA (Minnesota), MA (Indiana), PhD (Yale), Assistant Professor of Sociology and Community Medicine (1964, 1966).

LARSON, Jerrold Gene, DDS BSc Pharm (Alberta), Sessional Lecturer in Dentistry (1965, 1966).

LASKIN, Manuel Mervin, BA (Saskatchewan), MD (Toronto), FRCS(C), Instructor in Surgery (1959, 1963).

LAUBER, John F., MA MALS PhD (Washington), Assistant Professor of English (1965, 1965).

LAURENSON, Rae Duncan, MB ChB (Aberdeen), Associate Professor of Anatomy (1963, 1963).

LAYCHUK, Julian Louis, MA (Alberta), Assistant Professor in Russian and Administrative Officer, Department of Slavonic Languages. (1962, 1964).

LAYCOCK, Arleigh Howard, BA (Toronto), PhD (Minnesota), Associate Professor of Geography (1955, 1960).

LE VANN, Leonard Jan, LRCP LRCS (Edinburgh), LRFPS (Glasgow), Lecturer in Psychiatry (1964, 1964).

LEE, Charles A., BBA, MBA (North Texas State), Associate Professor of Commerce (1962, 1962).

LEEDER, James Richard, BSc MD (Alberta), FACOG, Instructor in Obstetrics and Gynaecology (1955, 1956).

LEESON, Thomas Sydney, MA MD (Cantab), MB BChir (Londan), Professor and Head of Anatomy (1963, 1963).

LEFEBVRE, Charles, BA (Laval), MD (Alberta), Lecturer in Medicine (1962, 1959).

LEFEBVRE, Verna Mary, BA BSc (Saskatchewan), BEd (Alberta), MS (Montana State), Assistant Professor of Household Economics (1966, 1966).

LEFRANCOIS, Guy Ronald, MEd (Saskatchewan), Assistant Professor of Educational Psychology (1966, 1966).

LEITCH, Lorne Campbell, LLB (Manitoba), MBA (Chicago), Associate Professor of Commerce (1961, 1961).

LEMIEUX, Raymond Urgel, BSc (Alberta), PhD (McGill), Professor of Organic Chemistry (1961, 1961).

LERBEKMO, John Franklin, BASc (British Columbia), PhD (California), Associate Professor of Geology (1956, 1960).

LESINS, Karlis Adolfs, BAgr (Latvia), LicAgr (Sweden), DSc (Alberta), Research Professor of Genetics and Plant Breeding (1954, 1966).

LEVERSEDGE, Miss Lillian Emily Mary, BA (Alberta), BLS (Toronto), Order Librarian 1946, 1947).

LEWIN, Victor, AA (Marin), AB PhD (California), Associate Professor of Zoology (1958, 1964).

LIEBEL, Miss Helen Pauline Grit, BA (Brooklyn), MA PhD (Northwestern), Assistant Professor of History (1962, 1962).

LILGE, Ewald Oscar, MSc (Alberta), Professor and Head of Mining and Metallurgy (1936, 1954).

LINCOLN, Edward, LRSM (Royal Schools), ARTC (Toronto) Assistant Professor of Music (1966, 1966).

LINTON, Neville Oswin, BCom (McGill), MA MALD (Fletcher), Assistant Professor of Political Science (1962, 1962).

LIVINGSTON, Arthur Eugene, BA (Fresno State College), MA PhD (Oregon), Professor of Mathematics (1962, 1964)

LLOYD, V. M., DDS BSc (Toronto), Sessional Lecturer in Dentistry (1963, 1963).

LOCK, Gerald Seymour Hunter, BSc PhD (Durham), Associate Professor of Mechanical Engineering (1963, 1964).

LOCKWOOD, Charles McDonald, BASc (Toronto), DipBusAdm (W. Ontario), Associate Professor in Extension (1963, 1964).

LOCOCK, Robert Anthony, MSc (Toronto), Assistant Professor of Pharmacy (1965, 1965).

LONGLEY, Richmond W., BSc (Acadia), AM EdM (Harvard), MA (Toronto), Associate Professor of Geography and Mathematics (1959, 1962).

LONGWORTH, Jack, BSc (Alberta), MSc (Illinois), Professor of Civil Engineering (1945, 1962).

LORCH, Lee, BA (Cornell), MA PhD (Cincinnati), Professor of Mathematics (1959, 1962).

LOVE, Harold Clyde, MS (Kansas State), PhD (Iowa State), Professor of Agricultural Economics (1962, 1962).

LOWIG, Henry Francis Joseph, DrRerNat (Prague), DSc (Tasmania), Associate Professor of Mathematics (1957, 1957).

LOWN, James Wiliam, BSc, ARCS PhD DIC (Imperial College, London), Assistant Professor of Chemistry (1964, 1964).

LUCAS, Oscar Nestor, Bachiller, Odontologo (Buenos Aires), PhD (Saskatchewan), Assistant Professor of Dentistry and Honorary Assistant Professor of Physiology (1965, 1965).

LUPTON, Mrs. Caroline, BA (McMaster), BLS (Toronto), Library Assistant (1964, 1964).

LUPUL, Manoly Robert, BA BEd (Alberta), MA (Minnesota), PhD (Harvard), Associate Professor of Educational Foundations (1958, 1963).

McALPINE, D. G., MD (Alberta), Sessional Instructor in Preventive Medicine (1963, 1963).

MacARTHUR, Russell Stuart, MEd (Alberta), PhD (London), Professor of Educational Psychology (1955, 1959)

MACBETH, Robert Alexander Leslie, BA MD (Alberta), MSc (McGill), FRCS(C) FACS, Professor and Head of Surgery (1953, 1960).

McCALLA, Arthur Gilbert, MSc (Alberta), PhD (California), FAIC, FRSC, Professor of Plant Biochemistry and Dean of Graduate Studies (1940, 1957).

McCALLA, Robert Irvine, BSc, MD (Alberta), Sessional Instructor in Pharmacology, Lecturer in Anaesthesia (1957, 1965).

McCARTEN, Alan Brock, MD (Manitoba), FRCS (England), FRCS(C), Assistant Clinical Professor of Surgery (1951, 1954).

McCAUGHEY, Gerald Sheldon, BA (McGill), MA (Washington), Associate Professor of English (1963, 1966).

McCLELLAND, Richard Charles, DDS (Alberta), Assistant Professor of Prosthetic Dentistry (1952, 1962).

McCLURE, Miss Ruth Elizabeth, RN BSc (Alberta), MPH (Pittsburgh), Associate Professor and Director of the School of Nursing (1956, 1957).

McCONNELL, Fleming, BA (British Columbia), MD (Toronto), FRCP(C), Professor and Head of Radiology (1965, 1965).

MacDONALD, Mrs. Emma, BA (Brit. Columbia), BLS (Toronto), Science Librarian (1949, 1951).

MACDONALD, Gordon Reid, BSc MD (Alberta), FACP, Assistant Professor of Pathology (1951, 1958).

McDONALD, Brian Hugh, BCom (Saskatchewan), MBA (California), Assistant to the President (1961, 1961).

McDONALD, W. John, BSc Eng MSc (Saskatchewan), PhD (Ottawa), Assistant Professor of Physics (1965, 1965).

MACDOUGALL, Douglas Harvey, DDS (Toronto), Assistant Professor of Dentistry (1958, 1962).

McELROY, Laird Ward, MSc (Alberta), PhD (California), FAIC, Professor and Head of Animal Science (1943, 1951).

McFADDEN, Kenneth David, BA (Concordia, Man.), MA Ed (Iowa State Teachers College), PhD (North Dakota), Assistant Professor of Anatomy (1965, 1965).

MacGREGOR, Donald Gordon, DDS (Alberta), Associate Professor of Oral Diagnosis (1953, 1953).

MacGREGOR, James Grierson, BSc (Alberta), MS PhD (Illinois), Associate Professor of Civil Engineering (1960, 1963).

McGEACHIN, Stewart Guthrie, BSc PhD (Glasgow), Assistant Professor of Chemistry (1964, 1964).

McGIBBON, Mrs. Evelyn Myrta, BSc (Alberta), Associate Director of Foof Services (1966, 1966).

McGREGOR, John Ross, BSc MED (Alberta), PhD (Cambridge), Professor of Mathematics (1959, 1966).

MACGREGOR, John Watt, BA MD (Alberta), FRCP(C), Professor and Head of Pathology (1932, 1951).

MacHARDY, Fenton Vincent, BE (Saskatchewan), MS (Northwestern), PhD (Edinburgh), Professor and Head of Agricultural Engineering (1950, 1958).

MacINNES, Glenda J., BA BLS (British Columbia), Library Assistant (1964, 1964).

MacINTYRE, Jean A., BA (Bryn Mawr), MA PhD (Yale), Assistant Professor of English (1962, 1963).

McINTYRE, John William Ransome, MRCS LRCP DA FFARCS (England), Assistant Professor of Anaesthesia (1964, 1965).

MacKAY, David Allister, BA (St. Francis Xavier), Dip Ed (Dalhousie), MA (Toronto), PhD (Alberta), Associate Professor of Educational Administration (1965, 1966).

McKEAN, John Richard, MA (Washington), Assistant Professor of Economics (1965, 1965).

McKECHNIE, Douglas Craig, DDS (Alberta), Sessional Lecturer in Dentistry (1962, 1962).

McKENZIE, Alvin Hubert, BSc MD (Alberta), MCOrth (Liverpool), FRCS(C), Instructor in Orthopaedic Surgery (1960, 1961).

MacKENZIE, Bruce Munro, DDS (Alberta), Sessional Lecturer in Prosthetic Dentistry (1951, 1954).

MacKENZIE, Miss Margery Walker, BA BEd (Alberta), AM (Stanford), Associate Professor of Classics (1947, 1964).

MacKENZIE, Walter Campbell, BSc MD CM Hon MD (Dalhousie), MS Minnesota), MS Minnesota), FACS FRCS(C) HonFRCS (Edinburgh), Dean of Medicine (1939, 1959).

McKINNEY, Richard Leroy, MA (Syracuse), PhD (Washington), Assistant Professor of Mathematics (1962, 1962).

McLACHLIN, Herbert John, BSc (McGill), MSc (Washington), Associate Professor of Physical Education (1948, 1956).

MacLACHLAN, Thomas Butler, MD (Toronto), FRCS(C), Teaching Fellow in Obstetrics and Gynaecology (1963, 1963).

MacLEAN, Hector Robertson, DDS (Alberta), FACD FICD, Dean of Dentistry (1936, 1958).

MACLEAN, William Alexander, MD (Manitoba), FRCS(C), Lecturer in Surgery (1958, 1964).

MACLEOD, Don Putnam, MSc PhD (Dalhousie), Assistant Professor of Pharmacology (1963, 1964).

McLEOD, Lionel Everitt, BSc MD (Alberta), MSc (McGill), FRCP(C), Associate Professor of Medicine, Instructor in Biochemistry (1957, 1963).

McMASTER, Rowland Douglas, MA PhD (Toronto), Associate Professor of English (1958, 1962).

McMINN, William Barton, BSc (Toronto), Assistant Professor of Computing Science (1962, 1962).

McMURCHY, Kenneth Alan, BA (Saskatchewan), DDS (Alberta), Professor and Head of Dental Science, Honorary Instructor in Anatomy (1948, 1961).

McNAMEE, John Joseph, BE BSc (Dublin), PhD (London), Professor of Mathematics and of Computing Science (1958, 1963).

MacNAB, Ross B. J., BS (Michigan), MA PhD (Michigan State), Associate Professor of Physical Education (1963, 1965).

McPHAIL, Clarence, W. B., BSc DDS (Alberta), MSD (Northwestern), FICD, Associate Professor and Head of Public Health Dentistry, Assistant to the Dean (1959, 1963).

MacPHERSON, Alexander Donald, MD (Alberta), Assistant Clinical Professor of Psychiatry (1947, 1955).

McQUITTY, James Brian, BAg (Queen's Belfast) MS (Michigan State), Assistant Professor of Agricultural Engineering (1966, 1966).

MacRAE, Patrick Daniel, DDS (Alberta), Associate Professor of Restorative Dentistry (1960, 1965).

McVEY, Wayne William, MA (Washington), Lecturer in Sociology and Anthropology (1966, 1966).

MACKIE, George Owen, MA DPhil (Oxford), Professor of Zoology (1956, 1966).

MACKI, Jack William, BS (Idaho), PhD (Cal. I.T.), Assistant Professor of Mathematics (1965, 1965).

MADSEN, Neil Bernard, MSc (Alberta), PhD (Washington, St. Louis), Associate Professor of Biochemistry (1962, 1962).

MALLETT, Marshall, MD CM (McGill), Lecturer in Radiology (1946, 1956).

MANCHESTER, Frank Derek, MSc (New Zealand), PhD (British Columbia), Associate Professor of Physics (1958, 1961).

MANDEL, Elias W., MA (Saskatchewan), PhD (Toronto), Professor of English (1957, 1964).

MANNING, Travis Warren, MSc (Oklahoma), PhD (Minnesota), Professor and Head of Agricultural Economics and Farm Management (1962, 1962).

MARAHRENS, Gerwin, PhD (Freiburg), Associate Professor of Germanic Languages (1962, 1966).

MARDIROS, Anthony Manuel, MA (Melbourne), MLitt (Cambridge), Professor and Head of Philosophy (1946, 1957).

MARGOLIS, Robert S., BA (Saskatchewan), DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

MARKLE, Alexander Gilmour, BA BEd MEd (Alberta), BJ (Carleton), Alumni Secretary and Press Officer (1951, 1951).

MARKS, Gerald Samuel, MSc (Cape Town), DPhil (Oxon), Associate Professor of Pharmacology (1962, 1964).

MARQUIS, Donald Edward Wilfred Robert, DDS (Alberta), Assistant Professor of Dentistry (1965, 1965).

MARSDEN, David John, BSc (Alberta), DCAe (Cranfield), PhD (Toronto), Associate Professor of Mechanical Engineering (1965, 1965).

MARSHALL, Frederick Chester, BSc MD (Alberta), FRCS(C), Instructor in Urology (1963, 1963).

MARTIN, John Kenneth, MB BS MRCS MRCP DCH (London), Professor and Head of Paediatrics (1957, 1957).

MARTIN, John Scott, BA (Toronto), PhD (Columbia), Assistant Professor of Chemistry (1963, 1963).

MARXHEIMER, Edward, MA (California), Assistant Professor of French (1961, 1963).

MASAMUNE, Satoru, AB (Tohoku), PhD (Berkeley), Associate Professor of Chemistry (1964, 1964).

MATAS, Matthew, MD (Alberta), Lecturer in Medicine (1951, 1967).

MATHESON, Miss Jean Isabel, BA (Saskatchewan), LCSLT, Assistant Professor of Pathology and Honorary Instructor in Physiology (1956, 1965).

MATHEWS, Robin Daniel Middleton, BA (British Columbia), MA (Ohio State), Assistant Professor of English (1961, 1962).

MATHIESON, James E. L., DDS (Alberta), Sessional Lecturer in Dentistry (1961, 1961).

MAY, Edward Charles, BA (Trinity), MA PhD (Princeton), Associate Professor of Classics (1947, 1964).

von MAYDELL, Ursula Mary, MSc (Alberta), Assistant Professor of Computing Science (1965, 1965).

MEHRA, Krishen L., MA (Panjab), PhD (Berkeley), Associate Professor of Mathematics (1963, 1965).

MEILICKE, Carl A., BComm (Saskatchewan), Assistant Professor of Socioiogy and Community Medicine (1966, 1966).

MEIR, Amram, MSc PhD (Hebrew University, Jerusalem), Associate Professor of Mathematics (1965, 1965).

MELTZER, Herbert, MD (Manitoba), Instructor in Thoracic Surgery (1946, 1946).

MELOFF, William Alan, MA (Alberta), Assistant Professor of Sociology and Anthropology (1966, 1966).

MELVIN, Robert Andrew, BA (Brandon College), Assistant Professor of Political Science (1966, 1966).

MENG, Te-sheng, BA MLaw (National Taiwan), BLS (Ottawa), Librarian (1965, 1965).

MENGES, Mrs. Eusrosinia Venita, BSc (Alberta), Assistant Dietitian in Residence Dining Halls (1960, 1960).

MENDRYK, Stephen, BEd in Phys Ed (Alberta), MS (California), Associate Professor of Physical Education (1955, 1961).

MERCER, Paul Frederick, DVM (Ontario Veterinary College), PhD (Cornell), Assistant Professor of Physiology (1964, 1964).

METCALFE, James Overgard, BSc MD (Alberta), FRCS(C), Clinical Professor of Urologic Surgery (1952, 1958).

MEYER, Walter C., DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

MEYERS, Albert, MS (City College, N.Y.) Assistant Professor of Industrial and Vocational Education (1965, 1965).

MICHALYSHYN, Bohdan, MD (Alberta), FRCS(C). Clinical Professor of Surgery (1951, 1957).

MICHIE, Thomas Campbell, MD (Alberta), Clinical Professor of Psychology (1966, 1966).

MIDDLEDITCH, Robert J., BA (Manitoba), Secretary of Faculty of Arts (1965, 1965).

MIELKE, Bruce, BSc MD (Alberta), Assistant Professor of Pathology (1964, 1965).

MIELKE, Miss Frances, BA (Manitoba), BLS (Toronto), Library Assistant (1961, 1961).

MIKLOS, Erwin, BA BEd (Saskatchewan), MEd PhD (Alberta), Associate Professor of Educational Administration (1963, 1963).

MILLER, Albert Eugene,BS (Colorado School of Mines), PhD (Iowa State), Associate Professor of Mining and Metallurgy (1966, 1966).

MILLER, Jack David Raoul, BSc Eng MB BCh (Witwatersrand), Instructor in Radiology (1964, 1964).

MILLIGAN, Larry Patrick, MSc (Alberta), Assistant Professor of Animal Science (1966, 1966).

MILLS, Kenneth I., BA (London), BPhil (Oxford), Assistant Professor of Philosophy (1966, 1966).

MITCHELL, Marvin, BSc MD (Alberta), FAAP, Instructor in Paediatrics (1964, 1965).

MONCKTON, George, MB BS MD MRCP (London), FRCP(C), Associate Professor of Neurology (1957, 1958).

MONOD, Mrs. Madeleine Jacqueline, LèsSciences Sociales (Geneva), BEd (Alberta), Assistant Professor of Secondary Education (1963, 1963).

MONOD, Pierre Alfred Roland, LicScEcon (Geneva), BEd MEd (Alberta), Assistant Professor of Romance Languages (1964, 1966).

MOON, John Wesley, BA (Bethany Nazarene), MA (Michigan State), PhD (Alberta), Associate Professor of Mathematics (1964, 1966).

MOONIE, George T., BA (Saskatchewan), MD (Alberta), Lecturer in Anaesthesia (1954, 1965).

MOORE, Charles Herald, BA (W. Ontario), DU (Paris), Professor of French (1954, 1966).

MOORE, Jeremy, BA (Dunelm), Assistant Professor of Art (1966, 1966).

MORAVCIK, Ivo, BA (Ohio), MA PhD (Indiana), Associate Professor of Economics 1960, 1963).

MOREAU, Joseph Paul, BA (Laval), MD (Alberta), FRCS(C), Lecturer in Orthopaedic Surgery (1950, 1958).

MORGAN, Lynn Parkes, BA (McMaster), Associate Registrar (1956, 1964).

MORGANTE, Odosca, MD (Rome), MSc PhD (McGill), Assistant Professor of Bacteriology and Virology (1962, 1962).

MOSER, Leo, BSc (Manitoba), MA (Toronto), PhD (North Carolina), FRSC, Professor and Head of Mathematics (1951, 1966).

MOSESON, Miss Helen Viola, BHEc (Alberta), MA (Michigan), Associate Professor of Household Economics (1960, 1965).

MOSKALYK, Richard Edward, BSP MSc (Saskatchewan), Assistant Professor of Pharmacy (1963, 1963).

MOTUT, Roger George, BA (Laval), MA BEd (Alberta), Associate Professor of French and Assistant Dean of Arts (1958, 1964).

MOTYL, Miss Barbara Jane, BSc (Carleton), Sessional Instructor in Clinical Pathology (1956, 1960).

MOWAT, Gordon Leslie, BSc (Brigham Young), MA EdD (Stanford), Professor of Educational Administration (1957, 1960).

MOYER, Donald John, MD (Western Ontario), FACOG, Instructor in Obstetris and Gynaecology (1958, 1964).

MUIR, James Douglas, BComm (British Columbia), MBA (California), Assistant Professor of Commerce (1964, 1964).

MULLEN, Ronald Perry, BA LDS (Saskatchewan), DDS (Alberta), MSD (Northwestern), Assistant Professor of Dentistry (1958, 1958).

MULLOY, Joseph Edward, BA BCom (NUI), CA, Assistant Professor in Extension (1962, 1962).

MUNN, Miss Alexandra Marguerite, AMus (Alberta), LRSM Dip (Julliard School), Assistant Professor of Music (1962, 1965).

MUNRO, Katherine Lois, BA BLS (British Columbia), Library Assistant (1966, 1966).

MURDESHWAR, Mangesh Ganesh, MA (Bombay), PhD (Alberta), Assistant Professor of Mathematics (1964, 1964).

MURRAY, David Moore, BA (Dalhousie), Assistant Professor of Philosophy (1961, 1961).

MURRAY, David William, BSc (Alberta), MSc DIC (London), Associate Professor of Civil Engineering (1960, 1961).

MUNRO, Stanley Robert, MA (Hawaii), Assistant Dean of Men, Assistant Foreign Student Advisor and Instructor in English (1966, 1966).

MUSACCHIO, Enrico, BA (Baldwin Wallace College, Ohio), Dottore in filosofia (Universita degli studi, Rome), Assistant Professor of Italian (1963, 1963).

MUTTITT, Eldon Leonard, BA (Saskatchewan, MD (Manitoba), Instructor in Clinical Medicine (1964, 1964).

MYERS, Gordon Edward, MSc (Alberta), PhD (McGill), Professor of Microbiology, Faculty of Pharmacy (1947, 1947).

NADER, Walter, MSc (Texas), DPhil (Vienna), Associate Professor of Petroleum Engineering (1960, 1963).

NAGABHUSHANAM, Kandula, BA (Andhra), MA (Madras), Fil Lic DPhil (Stockholm), Professor of Mathematics (1965, 1965).

NAIMPALLY, Somasshekhar Amrith, MSc (Bombay), PhD (Michigan State), Assistant Professor of Mathematics (1965, 1965).

NARAYANA, Tadepalli, MA (Madrass and Bombay), PhD (North Carolina), Professor of Mathematics (1958 1966).

NASH, Charles William, MSc PhD (Minnesota), Professor of Pharmacology (1954, 1957).

NASH, David, BSc (London), PhD (Cantab), Assistant Professor of Genetics (1965, 1965).

NAY, Marshall Alexander, MSc BEd (Alberta), Associate Professor of Secondary Education (1960, 1963).

NEAL, Walter Douglas, BSc BA BEd MEd (W. Australia), EdD (Columbia), Professor of Educational Administration.

NEILSON, George Croydon, MA PhD (British Columbia), Professor of Physics (1959, 1966).

NELSON, James Malcolm, BA (W. Ontario), MA (Toronto), Assistant Professor of English (1963, 1963).

NELSON, Mrs. Jean Clyne, MB ChB (Aberdeen), DCH (London), MRCP (Edinburgh), Instructor in Paediatrics (1955, 1955).

NELSON, Leonard Doyal, MEd (Alberta), PhD (Minnesota), Professor of Elementary Education (1959, 1966).

NELSON, Thomas Morgan, MA (Michigan State College), PhD (Michigan State University), Associate Professor of Psychology (1964, 1964).

NELSON, Thomas Robert, MB ChB (Edinburgh), FRCOG (London), FRCS(C) Clinical Associate Professor of Obstetrics and Gynaecology (1957, 1963).

NETTLER, Gwynn, AB (UCLA), MA (Claremont), PhD (Stanford), Professor of Sociology (1964, 1966).

NEWBOUND, Kenneth Bateman, MSc (Manitoba), PhD (Massachusetts Institute of Technology), Professor of Physics and Associate Dean, Faculty of Science (1948, 1964).

NEWTON, Miss Bertha Morse, BSc (S. California), AM (Chicago), EdD (Missouri), Associate Professor of Education (1945, 1955).

NIX, Nelson William, BSc MD (Alberta), FACA, Assistant Clinical Professor of Anaesthesia (1955, 1959).

NODEN, Denys, MA (Cantab), BLS (McGill), Law Librarian (1956, 1956).

NOORZOY, M. Siddieq, MA (Berkeley), PhD (Washington), Assistant Professor of Economics (1965, 1966).

NOUJAIM, Antoine Aki, BSc (Cairo), MS PhD (Purdue), Assistant Professor of Pharmacy (1966, 1966).

NOVAKSHONOFF, William Russell, BA BEd (Saskatchewan), MA (Alberta), Lecturer in Slavonic Languages (1966, 1966).

NOWAKOWSKY, B. M., DDS (Alberta), Sessional Lecturer in Dentistry (1964, 1964).

NUNN, Charles Christopher, BA (Oxford), Lecturer in Economics (1965, 1965).

NURSALL, John Ralph, MA (Saskatchewan), PhD (Wisconsin), Professor and Head of Zoology (1953, 1964).

NURSALL, Mrs. Mary, BA (Toronto), MA (Saskatchewan), Lecturer in Physiology (1954, 1964).

NUTTALL, John Blakely, MASc (British Columbia), DIC (London), Associate Professor of Civil Engineering (1961, 1963).

NYBERG, Verner Richard, MEd (Alberta) Associate Professor of Educational Psychology (1966, 1966).

O'BRIEN, Joseph A., BSc MD (Alberta), Instructor in Preventive Medicine (1963, 1964).

OLSEN, Clare W., BA (Saskatchewan), DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

OLSEN, William Charles, MSc (British Columbia), PhD (Alberta), Assistant Professor of Physics (1964, 1964).

OLSON, Eugene George, BA (Saskatchewan), BLS (McGill), Periodicals Librarian (1964, 1965).

ORFORD-SMITH, Edward Stuart, MA MB BChir (Cambridge), DPH (London), MRCS (England), Lecturer in Preventive Medicine (1955, 1955).

ORRELL, John Overton, BA (Oxford), MA (Toronto), Assistant Professor of English (1961, 1961).

OSTAPOVITCH, Miss Annette Dorothy, BSc (Saskatchewan), MA (Michigan State), Assistant Professor of Household Economics (1965, 1965).

OSTOLOSKY, Raymond John, BSc MD (Alberta), FRCS(C) MRCOG, Instructor in Obstetrics and Gynaecology (1960, 1962).

OTTO, Frederick Douglas, MSc (Alberta), PhD (Michigan), Associate Professor of Chemical Engineering (1961, 1964).

PAAP, Mrs. Thea, BA BLS (British Columbia), Library Assistant (1965, 1965).

PACKER, John George, BSc (London), Associate Professor of Botany (1958, 1965).

PACKER, Merrill Wiser, BS (Utah State), DDS MSD (Minnesota), Associate Professor and Head, Division of Periodontics, Faculty of Dentistry (1964, 1964). Physiology (1965, 1965).

PADSHA, Syed Mahmood, MB BS (Karachi), PhD (London), Assistant Professor of

PAEZ, Pedro, Bach (J.J. Vrquiza National College), Medico Cirujano (Cordoba National University, Uruguay), Assistant Professor of Fitness Research Unit (1965, 1965).

PAI, Chik Hyun, MD MMedSci (Seoul), PhD (Cincinnati), Assistant Professor of Microbiology (1966, 1966).

PANAR, David, MSc (Michigan), Associate Professor of Mechanical Engineering (1946, 1955).

PANKHURST, John Howard, BSc (Sir George Williams), MSc (Alberta), Sessional Instructor in Physiology (1964, 1964).

PARANCHYCH, William, BSc (Alberta), PhD (McGill), Assistant Professor of Biochemistry (1963, 1963).

PARANJAPE, B. V., MSc (Nagpur), PhD (Liverpool), Associate Professor of Physics (1961, 1964).

PARKER, Douglas Vernon, BA (Manitoba), MA (Washington), Assistant Professor of Secondary Education (1966, 1966).

PARKER-JERVIS, Noel BA Dip Ed (British Columbia), Assistant Professor of English (1962, 1966).

PARLEE, Stephen Sackville, BSc MD (Alberta), FACS DABOG FRCOG, Assistant Clinical Professor of Obstetrics and Gynaecology (1947, 1963).

PASCOE, Herbert, BA MD Diploma Psychiatry (Toronto), FRCP(C), Instructor in Psychiatry (1959, 1963).

PASHNIAK, Daniel Walter, BS (Walla Walla), MS (Illinois), Assistant Professor of Mechanical Engineering (1963, 1963).

PATCHING, Thomas Herbert, BSc (Alberta), Professor of Mining and Metallurgy (1947, 1958).

PATEL, Nagin K., BPharm (Gujarat), MS (Temple), PhD (Maryland), Assistant Professor of Pharmacy (1966, 1966).

PATERSON, Alan Robb Phillips, MA PhD (British Columbia), Professor of Biochemistry and Director of the McEachern Laboratory (1962, 1962).

PATRICK, Andrew, MB ChB (Glasgow), FRCS(C), Sessional Instructor in Surgery (Ophthalmology) (1964, 1964).

PATTERSON, Robert Steven, MEd (Alberta), Assistant Professor of Educational Foundations (1966, 1966).

PAWLIUK, Z. Michael, DDS (Alberta), MS (Northwestern Dental School, Illinois), Assistand Professor of Dentistry (1962, 1969).

PAWLUK, Steven, MSc (Alberta), PhD (Minnesota), Associate Professor of Soil Science (1959, 1963).

PAWLUK, William, BSc MD (Alberta), Sessional Instructor in Surgery (1964, 1964).

PAXTON, James R., BS (San Diego State College), MBA (UCLA), Assistant Professor of Business Administration and Commerce (1965, 1966).

PAYNE, Irving John, MA (British Columbia), PhD (Pennsylvania), Associate Professor of Bacteriology (1960, 1964).

PEACOCK, Gordon Bruce, BEd (Alberta), MA (Carnegie), Professor and Head of Drama (1953, 1965).

PEACOCKE, Charles Thomas, BEd BA (Alberta), MFA (Carnegie), Assistant Professor of Drama (1961, 1963).

PEARCE, James William, MD CM (Queen's), DPhil (Oxford), Professor of Physiology (1955, 1955).

PEDDLE, Garry John Douglas, BS (Harding College, Arkansas), MA PhD (Toronto), Assistant Professor of Chemistry (1964, 1964).

PEEL, Bruce Braden, MA (Saskatchewan), BLS (Toronto), Librarian to the University (1951, 1956).

PERRONI, Amedeo Francesco Giulio Giuseppe, BA (Toronto), Assistant Professor of Commerce (1962, 1962).

PETERSEN, Thomas Alfred, BSc (Alberta), MA (Washington State), Assistant Professor and Agricultural Supervisor for Extension (1963, 1963).

PETERSON, Allan Wallace, MSc (Alberta), Associate Professor of Civil Engineering (1953, 1959).

PETERSON, Frank Lowell, DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

PHIBBS, Edgar, MA (Cambridge), Associate Professor of Mathematics (1947, 1952).

PHILLIPS, David Lloyd Garrick, MD (Alberta), Instructor in Psychiatry (1955, 1955).

PHILLIPS, Ronald Edward, BSc (Alberta), Associate Professor of Electrical Engineering and Superintendent of Buildings (1942, 1963).

PIKE, Robert Marden, MSc (London), PhD (Australian National University), Assistant Professor of Sociology and Educational Foundations (1965, 1966).

PILKINGTON, Wilfred, MA BEd (Alberta), Associate Professor of Secondary Education and Assistant Dean (1952, 1957).

PINNINGTON, Eric Henry, BSc DIC PhD (London), Assistant Professor of Physics (1965, 1965).

PINOLA, Rudolph, BA (Minnesota), MS PhD (Wisconsin), Associate Professor in Faculty of Commerce (1964, 1964).

PISESKY, Walter, BSc MD (Alberta), FRCS(C), Instructor in Surgery (1961, 1964).

PLAMBECK, James Alan, BA (Carleton, Minnesota), MS PhD (Illinois), Assistant Professor of Chemistry (1965, 1965).

PLITT, Loverne Rubin, MSc (Alberta), Assistant Professor of Mining and Metallurgy (1966, 1966).

POCKLINGTON, Thomas Carey, BA (Toronto), PhD (Indiana), Assistant Professor of Political Science (1961, 1961).

POIRIER, Richard, BA MD (Montreal), Lecturer in Paediatrics (1948, 1956).

POLO, José Polo, LicFil DrFil (Granada), Assistant Professor of Romance Languages (1966, 1966).

PORTEOUS, John Wardlaw, MSc (Alberta), Professor of Electrical Engineering (1930, 1955).

POUNDER, James Rudsdale, MA (Toronto), PhD (Dublin), Associate Professor of Mathematics (1955, 1962).

POWRIE, Thomas Lawrence, BSA MA (Saskatchewan), DPhil BPhil (Oxford), Associate Professor of Economics (1959, 1964).

PRAGNELL, Bartley R., Dip (Winnipeg School of Art), Dip (School of Art and Design, Montreal), Assistant Professor of Art (1963, 1963).

PREITZ, Clarence H., BS (Millersville State College), MS (Pennslyvania), Assistant Professor of Industrial and Vocational Education (1965, 1965).

PRESTON, Thomas Alexander, MA (Cantab), Associate Professor of Agricultural Engineering (1963, 1963).

PRESTON, William Walford, BSc (Queen's), Associate Professor of Civil Engineering (1938, 1950).

PRICE, George, BA BD MA (Wales), Associate Professor of Philosophy (1964, 1966).

PRIDEAUX, Gary Dean, BA (Rice), Assistant Professor of Linguistics, Germanic Languages (1966, 1966).

PURCELL, M. Geneva, BN (McGill), MS (Boston), Assistant Professor, School of Nursing (1966, 1966).

PURKIS, Miss Lloane Gayle, BA (Alberta), BLS (British Columbia), Library Assistant (1964, 1964).

PURVIS, Neil MacLean, BSc MEd (Alberta), Associate Professor of Elementary Education (1964, 1964).

PYRCH, Mrs. Jeanette Anne, BA (Alberta), MLS (Simmons College), Library Assistant (1964, 1966).

QUEHL, Eby, mid MD (Alberta), MRCOG (London), Lecturer in Obstetrics and Gynaecology (1950, 1955).

QUINLAN, Peter Thomas, BSc MB ChB (Manchester), FRCS (Edinburgh), Lecturer in Surgery (1961, 1961).

QUON, Donald, MSc (Alberta), ScD (Massachusetts Institute of Technology), Professor of Chemical Engineering (1949, 1964).

QURESHI, Ahmad H., MA (Panjab), BS MA PhD (Illinois), Assistant Professor of English (1961, 1961).

QURESHI, Saleem M. M., MA (Agra), LLB (Lucknow), PhD (Pennsylvania), Associate Professor of Political Science (1963, 1965).

RACZ, Mrs. Darilyn Ann, BSc (Alberta), Instructor in Pathology (1966, 1966).

RAJARATNAM, Nallamuthu, BE MSc (Madras), PhD (Indiana Institute of Science), Assistant Professor of Civil Engineering (1966, 1966).

RALETICH, Miss Ivana, Lic (Belgrade), MLS (Toronto), Library Assistant (1960, 1960).

RAMSAY, Colin George, BSc (New Brunswick), MD CM (McGill), Instructor in Medicine (1958, 1958).

RANKIN, David, MA (British Columbia), PhD (Alberta), Assistant Professor of Geophysics (1964, 1964).

RAO, Mathukumalli Venkata Subba, MA MSc PhD (Madras), Associate Professor of Mathematics (1963, 1963).

RAPIER, Dunbar Outten Cecil, BA (McGill), MBChB (Edinburgh), Lecturer in Psychiatry (1964, 1965).

RASK, Miss Judith Ann, DipDent Hyg (Toronto), Instructor in Dentistry (1965, 1965).

RAYBACK, Joseph G., AM PhD (Western Reserve), Professor of History (1964, 1964).

RATSOY, Eugene William, BSc BEd (Alberta), Assistant Professor of Educational Administration (1965, 1965).

RAZAVY, Mohsen Modarres, MA (Tehran), PhD (Louisana State), Associate Professor of Physics (1963, 1966).

RAZZELL, Wilfred Edwin, BA (British Columbia), PhD (Illinois), Professor and Head of Microbiology (1966, 1966).

READ, Frederick Douglas, BSc DDS (Alberta), Lecturer in Dentistry (1959, 1960).

RECKORD, Mary, MA (Manchester), PhD (London), Assistant Professor of History (1965, 1965).

REES, Donald Leslie, BSc MD (Alberta), Instructor in Surgery (1960, 1961).

REESE, Willard Francis, BS (U.S. Merchant Marine Academy), MA (Colorado State College), Associate Professor of Elementary Education (1960, 1963).

REEVES, Arthur Weir, BA (Alberta), MA (Chicago), EdD (Stanford), Professor and Head of Educational Admisistration (1956, 1956).

REGAN, John Owen, BA (McMaster), EdD MEd (Buffalo), Assistant Professor of Secondary Education (1963, 1963).

REID, David William James, BSc MD (Alberta), FRCS(C) FACOG(JF), Instructor in Obstetrics and Gynaecology (1961, 1963).

REIFFENSTEIN, BSc (McGill), PhD (Manitoba), Assistant Professor of Pharmacology (1964, 1964).

REINELT, Erhard Rudolph, BSc PhD (Alberta), MA (Toronto), Assistant Professor of Geography (1965, 1965).

REINHOLD, Ernest, BSc MA (Alberta), PhD (Michigan), Professor of German and Head of Germanic Languages, Linguistics (1952, 1965).

REMPEL, Peter P., BA BEd (Saskatchewan), PhD (Minnesota), Associate Professor of Psychology and Acting Director and Senior Counsellor of Student Counselling Services (1959, 1964).

RENNER, Miss Ruth Olive Ann, MSc (Alberta), PhD (Cornell), Associate Professor of Household Economics (1960, 1963).

RENNIE, David Lyle, BSc MA (Alberta) Student Counsellor (1966, 1966).

RENTIERS, Paul Louis, BA MD (Alberta), MSc (Minnesota), Assistant Clinical Professor of Dermatology (1964, 1964).

REVELL, Miss Grace Aileen, RN (Alberta), Infirmary Nurse (1935, 1935).

RICHARD, Harold Lane, MD (Alberta), FRCS(C) FACS, Assistant Clinical Professor of Surgery (1939, 1962).

RIEDEL, Bernard Edward, MSc (Alberta), PhD (W. Ontario), Executive Assistant to the Vice-President and Professor of Pharmacy (1946, 1961).

RITCHIE, Douglas Campbell, BSc MD (Alberta), FACS DABOG, Associate Clinical Professor of Obstetrics and Gynaecology (1949, 1966).

ROBBERECHT, Paul Albert, BA (McMaster), MA (Dalhousie), Assistant Professor of French (1965, 1965).

ROBBINS, Stuart George, Dip Phys Ed (St. Luke's, Exeter), Lecturer, Physical Education (1964, 1964).

ROBBLEE, Alexander Robinson, MSc (Alberta), PhD (Wisconsin), Professor of Poultry Nutrition (1945, 1957).

ROBERTSON, Gordon Raymond, DDS (Alberta), Lecturer in Dentistry (1959, 1959).

ROBERTSON, James Alexander, MSc (Manitoba), Associate Professor of Soil Science (1955, 1964).

ROBERTSON, Jean Elizabeth, BSc BEd MEd (Alberta), Assistant Professor of Elementary Education (1965, 1965).

ROBINSON, Donald Baker, MASc (British Columbia), PhD (Michigan), FCIC, Professor and Head of Chemical and Petroleum Engineering (1948, 1959).

RODKIEWICZ, Czeslae Mateusz, DipIng (Polish Unviersity College), MS (Illinois), Associate Professor of Mehanical Engineering (1958, 1964).

RODIN, Alvin E., MSc MD (Manitoba), Instructor in Pathology (1961, 1962).

RODMAN, Floyd Silas Beverley, MSc (Saskatchewan), PhD (Minnesota), MD (Alberta), Assistant Clinical Professor of Medicine (1948, 1955).

ROGERS, Walter Bob, BS (Texas Tech College), MS (Arizona), PhD (Oklahoma State), Associate Professor of Agricultural Economics (1964, 1965).

ROLLINS, Bryce, BCom (Alberta), CA, Associate Professor of Commerce (1961, 1964).

ROLSTON, Thomas, LRCM (London), Associate Professor of Music (1958, 1963).

ROONEY, Mrs. Sieglinde Emilie Hanna, BA (Saskatchewan), BLS (Toronto), Library Assistant (1965, 1965).

ROSE, Patrick Blair, MD (Alberta), Instructor in Preventive Medicine (1964, 1964).

ROSE, Edward Joseph, AM (Brooklyn), PhD (Toronto), Associate Professor of English (1958, 1964).

ROSEN, Lawrence Sydney, BComm (British Columbia), MBA DBA (Washington), CA Associate Professor of Business Administration and Commerce (1966, 1966).

ROSS, Colin Andrew, MD (Alberta), FRCS(C), Instructor in Surgery (1954, 1954).

ROSS, Donald Murray, MA (Dalhousie), PhD (Cambridge), Professor of Zoology and Dean of the Faculty of Science (1961, 1961).

ROSSALL, Richard Edward, BSc MB ChB MD (Leeds) MRCP FRC(C), Associate Professor of Medicine (1957, 1966).

ROSTRUP, Olav, MD (Alberta), FACS FRCS(C), Clinical Professor of Orthopaedic Surgery (1939, 1957).

ROTHROCK, George Abel, BA (Delaware), MA PhD (Minnesota), Associate Professor of History (1964, 1964).

ROUSELL, Murray Alexander, BCom (McGill), CA, Chief Accountant (1946, 1963).

ROWAND, Elizabeth Frances, OTR, Lecturer in Physical and Occupational Therapy (1961, 1961).

ROWSWELL, Ronald Gordon, BSc (Alberta), BLS (British Columbia), Library Assistant (1965, 1965).

ROY, GERALD, BSc (W. Ontario), PhD (Florida State), Assistant Professor of Physics (1965, 1965).

ROYCE, Joseph, AB (Denison), PhD (Chicago), Professor and Head of Psychology (1960, 1960).

ROZEBOOM, William Warren, BS PhD (Chicago), Associate Professor of Psychology (1964, 1964).

RULE, Mrs. Brendan Gail, BA (UC Riverside), MA (UC Santa Barbara), PhD (Washington), Assistant Professor of Psychology (1964, 1965).

RULE, Stanley Jay, BA (Redlands), MA PhD (Washington), Assistant Professor of Psychology (1962, 1962).

RUNQUIST, Willard Nelson, AB (Redlands), MA PhD (Northwestern), Associate Professor of Psychology (1962, 1962).

RUSSELL, Phyllis, BA (Alberta), BLS (Toronto), Medical Librarian (1958, 1959).

RUTH, Royal Francis, BA (Grinnell), MSc PhD (Wisconsin), Associate Professor of Zoology, Associate Member of Biochemistry (1961, 1965).

RYAN, Aylmer Arthur, MA (Alberta), Professor of English, Provost, Executive Assistant to the President (1940, 1962).

RYAN, James Thomas, MSc (Missouri), Assistant Professor of Chemical Engineering (1965, 1965).

RYAN, John Martin, BSc (St. Francis Xavier), MD CM (Dalhousie), Lecturer in Medicine (1958, 1964).

SADLER, Gerald Wesley, BSc (Saskatchewan), MSc (Illinois), Associate Professor of Mechanical Engineering (1947, 1959).

ST. CLAIR, William Roy, MB ChB (Edinburgh), MRCP (Edinburgh), Instructor in Medicine (1956, 1956).

SALT, Walter Raymond, MSc (Alberta), Professor of Anatomy (1949, 1958).

SALYZYN, Vladimir, MA (Alberta), BComm (Saskatchewan), Assistant Professor of Economics (1965, 1965).

SAMPLE, John Thomas, MA PhD (British Columbia), Professor of Physics (1958, 1966).

SAMUEL, George, MA (Glasgow), Associate Professor of French, Administrator of Professional Exams (1948, 1956).

SAMUEL, George, MA (Alberta), Assistant Professor of English (1963, 1965).

SAMUELS, Harold Louis, BSc DDS (Alberta), Assistant Professor of Operative Dentistry (1948, 1952).

SANDERS, James, BA (Toronto), MA (Queen's), PhD (Syracuse), Associate Professor of Mathematics (1963, 1963).

SANDERS, Patricia M., MSc PhD (London), Lecturer in Pharmacology (1963, 1965).

SAPKOS, William Peter, DDS (Alberta), Sessional Lecturer in Dentistry (1965, 1965).

SASONKIN, Manus, MMus (Yale), PhD (Boston), Associate Professor of Music (1966, 1966).

SCHAARSCHMIDT, Gunther, MA (Alberta), Assistant Professor of Russian (1963, 1965).

SCHACTER, Melville, MSc MD (McGill), Professor and Chairman of Physiology (1965, 1965).

SCHAEFER, Otto, MD (Heidelberg), Instructor in Clinical Medicine (1965, 1965).

SCHAEFFER, Mrs. Barbara Heckman, BA (Douglas College), MS (Rutgers), Assistant Professor of Psychology (1966, 1966).

SCHAEFFER, Dirk L., BA (Rutgers), MA (Temple), Assistant Professor of Psychology (1966, 1966).

SCHIFF, Harry, MSc PhD (McGill), Professor of Physics and Chairman of the Department (1953, 1964).

SCHMID, Gerhard M., PhD (Innsbruck), Assistant Professor of Chemistry (1962, 1962).

SCHMIDT, W. H. O., BA DipEd (South Africa), PhD (Leipzig), Professor of Educational Psychology (1966, 1966).

SCHNECK, Rodney Edward, MBA (Denver), DBA (Washington), Associate Professor of Business Administration and Commerce (1966, 1966).

SCHNELL, Mrs. Natalie, BSc (Alberta), Assistant Dietitian (1959, 1959).

SCHONBAUM, Gregory Richard, BSc PhD (London), Associate Professor of Biochemistry (1962, 1964).

SCHRAG, Astor Ralph, MD (Alberta), Associate Clinical Professor of Psychiatry (1945, 1966).

SCHULTZ, Wolfgang Martin, Diplomlandwirt Dr Landwirtschaft (Justus Liebig), PhD (Oklahoma State), Associate Professor of Agricultural Economics (1966, 1966).

SCHUMACHER, Miss Marguerite Eva, BSc (Western Reserve), MA (Columbia), Adviser to Schools of Nursing (1958, 1958).

SCHWARTZ, Bernard, BA (Brooklyn), MS (Pratt Institute), DEd (Pennsylvania State), Assistant Professor of Elementary Education (1965, 1965).

SCOTT, Miss Alison Pettigrew, MA BLitt (Oxford), PhD (Queen's), Associate Professor of German (1959, 1964).

SCOTT, Donald Burton, BA (Toronto), PhD (McGill), Professor of Physics and Head of Computing Science (1940, 1964).

SCOTT, Mrs. Flora Halina, BSc MD (Alberta), Sessional Clinical Instructor in Psychiatry (1965, 1965).

SCRAGG, Richard Dennison, BSc MD (Alberta), Sessional Instructor in Anaesthesia (1965, 1965).

SECORD, David C., DVM (Ontario Veterinary College), MVSc (Toronto), Associate Professor and Director of the Vivarium (1961, 1965).

SEGALL, Joseph Moisha Leo, MB BS (London), Sessional Lecturer in Preventive Medicine (1965, 1966).

SEGER, John Edward, BSc (Oregon State College), MEd (Oregon), Associate Professor of Educational Administration (1965, 1965).

SEGUIN, Herb Joseph John, BSc (Alberta), PhD (London), Associate Professor of Electrical Engineering (1966, 1966).

SEIFRIED, Neil Robert Michael, BA (Toronto), MA (Ohio State), Assistant Professor of Geography (1966, 1966).

SELINGER, Zelig, MD (Montreal), Instructor in Psychiatry (1954, 1954).

SELLAR, Forbes Keith, BL (Aberdeen), Associate Professor of Law (1966, 1966).

SEREDA, Mitro Mike, MD (Alberta), Lecturer in Medicine and Assistant Professor of Pathology (1938, 1960).

SHANDRO, William Alexander, MD CM (McGill), FRCS(C), Assistant Clinical Professor of Surgery (1943, 1964).

SHARMA, Ambikeshwar, MA (Agra), PhD (Lucknow), Professor of Mathematics (1962, 1966).

SHARMA, Mohan Lal, BA (Lucknow), Dip LS (Banaras Hindu), MSLS (Western Reserve), Librarian (1965, 1965).

SHARPLIN, Mrs. Janet, BSc PhD DIC (London), Lecturer in Entomology (1960, 1963).

SHAW, James Albon, BS (Houston), MA (Indiana), Assistant Professor in Extension (1963, 1963).

SHAW, Miss Margaret, BSc (Alberta), Manager of Food Services (1963, 1963).

SHEININ, Saul Solomon, MA PhD (Toronto), Associate Professor of Physics (1962, 1965).

SHER, William, BL (National Yunnan), MA (Minnesota), Assistant Professor of Business Administration and Commerce (1965, 1965).

SHERMAN, Ludwik, MB (Poznan), Lecturer in Medicine (1955, 1964).

SHIELDS, John Marty, DDS (Alberta), Sessional Lecturer in Dentistry (1960, 1960).

SHINER, Roger Alfred, BA (Cantab), MA (Alberta), Assistant Professor of Philosophy (1966, 1966).

SHIMIZU, Henry J., MSc MD (Alberta), FRCS(C), Sessional Instructor in Surgery (1964, 1964).

SHNITKA, Theodor Khyam, MSc MD (Alberta), Associate Professor of Pathology (1954, 1962).

SIEGENBERG, Joe, BSc MB BCh (Witwatersrand), MSc (Alberta), FRCS (England), FRCS(C), Instructor in Surgery (1963, 1964)

SIEMENS, Reynold, BA (Manitoba), MA (Wisconsin), Assistant Professor of English (1966, 1966).

SIGURDSON, Solberg Einar, BSc (Manitoba), MA (Toronto), PhD (Wisconsin), Assistant Professor of Secondary Education (1964, 1964).

SIKORA, Joseph, BSc DDS (Alberta), Sessional Lecturer in Dentistry (1962, 1962).

SILLS, Royal Cleveland, DDS (Alberta), Lecturer in Prosthetic Dentistry (1955, 1955).

SIMMONDS, Sidney Herbert, MSc (Alberta), PhD (Illinois), Associate Professor of Civil Engineering (1957, 1963).

SIMPSON, William John, DDS MSc (Alberta), Asscociate Professor and Head of Pedodontics (1965, 1965).

SINCLAIR, Robert William, BFA (Manitoba), Lecturer in Art (1965, 1965).

SINCLAIR, Roy George Gunn, BSc (Alberta), PhD (Massachusetts Institute of Technology), Assistant Professor of Mathematics (1960, 1960).

SINCLAIR, Stewart Ronald, MSc (Alberta), Professor and Head of Civil Engineering (1945, 1959).

SITWELL, Oswald Francis George, BA (Oxon), MA (Toronto), Assistant Professor of Geography (1964, 1964).

SKOROPAD, William Peter, MSc (Alberta), PhD (Wisconsin), Associate Professor of Plant Pathology (1959, 1961).

SLAVUTYCH, Yar, AM PhD (Pennsylvania), Associate Professor of Slavonic Languages (1960, 1966).

SMALL, George Roger, BA MA (Saskatchewan), MA (Toronto), Instructor in Physics 1963, 1963).

SMILLIE, Keith William, BA (W. Ontario), MA PhD (Toronto), Associate Professor of Computing Science (1963, 1963).

SMILLIE, Lawrence Bruce, BSc (McMaster), MA PhD (Toronto), Associate Professor of Biochemistry (1955, 1957).

SMITH, Alan Arthur, MMus (Toronto), Associate Professor of Elementary Education (1957, 1960).

SMITH, Alexander, QC BA LLB (Alberta), JSD (Stanford), Professor of Law (1947, 1950).

SMITH, Christopher J., BSc PhD (London), Assistant Professor of Biochemistry (1966, 1966).

SMITH, Douglas Elstow, MA (Queen's), PhD (Harvard), Professor of Psychology and Dean of Arts (1937, 1958).

SMITH, Edward S. O., MA MB BChir (Cantab), LRCP MRCS DPH (London), DIH (England), Assistant Clinical Professor of Preventive Medicine (1955, 1963).

SMITH, Miss Helen M., BA (Queen's), BLS (British Columbia), Library Assistant (1965, 1965).

SMITH, Murray Frank Robert, BEd (Alberta), Associate Professor of Physical Education (1958, 1964).

SMITH, Peter John, MA (New Zealand), Associate Professor of Geography (1959, 1964).

SMITH, Richard C., BA (Austin), BD (Louisville Presbyterian), MA (Kentucky), PhD (Illinois), Assistant Professor of Classics (1965, 1965).

SMITH, Samuel Ivan, BA (London), MA PhD (McGill), Assistant Professor of Geography (1964, 1964).

SMITH, Walter Alvah Samuel, BA (Redlands), MA PhD (Pennsylvania), Professor of Psychology and Executive Sercetary, Academic Planning Committee (1962, 1966).

SMITH, Warren Edward, MSc (Alberta), PhD (Nebraska), Associate Professor of Genetics and Plant Breeding and Co-Acting Head of Genetics (1947, 1966).

SMITH, William Donald, BPHE (Toronto), MA (Columbia), EdD (Buffalo), Professor of Physical Education (1947, 1958).

SYNDER, Sally, BA PhD (Washington), Associate Professor of Anthropology (1966, 1966).

SMY, Peter R., BSc PhD (Imperial College, London), Professor of Electrical Engineering (1966, 1966).

SOLTICE, Norman John, BSc MD (Alberta), FRCP(C), Sessional Instructor in Anaesthesia (1965, 1965).

SOROKIN, Mrs. Lois Adeline, BA BLS (Toronto), Librarian, Extension (1962, 1962).

SOWTON, Ian Charles, MA (Toronto), Associate Professor of English (1956, 1963).

SPANER, Sidney, BA MD (Alberta), Clinical Professor of Psychiatry (1948, 1955).

SPARBY, Harry Theodore, BSc MA (Alberta), PhD (Stanford), Professor of Educational Administration (1946, 1956).

SPARLING, Mrs. J. Grant, BA DipSW (Toronto), Dean of Women (1960, 1960).

SPEAKMAN, Thomas John, MSc (McGill), MD (Manitoba), FRCS(C) FACS, Assistant Clinical Professor and Head of Neuro-Surgery and Honorary Lecturer in Physiology (1951, 1965).

SPEARMAN, Donald, MA (McGill and Montreal), PhD (Montreal), Associate Professor of Psychology (1948, 1955).

SPENCER, Mrs. Eileen, BA (Saskatchewan), MA (Bryn Mawr), PhD (California), Professor of Plant Science and Biochemistry (1953, 1964).

SPERBER, Geoffrey Hillard, BSc BDS (Witwatersrand), MS (Rochester), Assistant Professor of Dentistry (1961, 1961).

SPRAGUE, Walter Howard, PhC (Alberta), Instructor in Pharmacy (1945, 1945).

SPROULE, Brian Ralph Jessup, MSc MD (Alberta), FRCP(C), Associate Professor of Medicine (1960, 1960).

STANFORD, Henry King, AB (Birmingham Southern), MA (Princeton), Lecturer in Germanic Languages and General Linguistics (1966, 1966).

STANG, Edwin A., DDS (Alberta), Lecturer in Dentistry (1962, 1962).

STARCHUK, Orest, LicJur et RerPol, Dr Jur et RerPol (Chernowitz), Professor of Russian and Head of Slavonic Languages (1949, 1966).

STAYURA, Lois Ann, MD (Alberta), FRCS(C), Associate Professor of Paediatrics (1965, 1966).

STEEN, William Irwin Maurice, DDS (Alberta), Lecturer in Operative Dentistry (1958, 1958).

STEIN, Richard Adolph, BSc (Alberta), MSc (Illinois), Assistant Professor of Electrical Engineering (1961, 1961).

STEINBERG, Charles, BS AM (Columbia), Assistant Professor of Economics (1964, 1964).

STEINER, André Louis, LèsSc (Strasbourg), DèsSc (Paris), Associate Professor of Zoology (1966, 1966).

STELCK, Charles Richard, MSc (Alberta), PhD (Stanford), Professor of Geology (1946, 1957).

STEPHANSON, Barney Thorvardur, BE (Saskatchewan), MSc (Minnesota), Associate Professor of Agricultural Engineering (1946, 1951).

STEPHENS, Herbert Henry, MD (Alberta), Lecturer in Medicine (1950, 1950).

STEPHENS, Ronald Edward, BEd BA (Alberta), EdM (Oregon), Assistant Professor of Elementary Education (1965, 1966).

STEPHENS, William Roger, DDS (Alberta), Sessional Lecturer in Dentistry (1965, 1965).

STEPHENS-NEWSHAM, Lloyd G., BA (Saskatchewan), PhD (McGill), Associate Professor of Physiology (1966, 1966).

STEWART, Allan Greenwood, MA (Queen's) PhD (W. Ontario), Instructor in Biochemistry and Medicine and Associate Professor of Paediatrics (1953, 1958).

STEWART, Duncan Russel, DDS (Alberta), Associate Professor of Prosthetic Dentistry (1946, 1954).

STEWART, Lorne Duncan, BEd BA (Saskatchewan), MEd (Alta), Associate Professor of Educational Administration (1965, 1965).

STEWART, Max Douglas, BA BCom (Alberta), MA (Toronto), PhD (Michigan State), Associate Professor of Economics (1965, 1965).

STEWART, Wilson Nichols, BA PhD (Misconsin), MA (Illinois), Professor of Botany (1966, 1966).

STINSON, Mrs, Caroline Gail, BHSc (Macdonald Institute), MSc (Alberta), Lecturer in Household Economics (1966, 1966).

STINSON, Shirley Marie, BSc (Alberta), MNS (Minnesota), Assistant Professor, School of Nursing (1958, 1965).

STOBBE, Miss Ellenora, Sessional Instructor in Clinical Pathology (1958, 1960).

STRANG, Judith Mary Ruth, BSs HEc (Ottowa), MSc (Manitoba), Assistant Professor of Household Economics (1965, 1966).

STRAUSZ, Otto P., Lic (Eotvos Lorand, Budapest), PhD (Alberta), Associate Professor of Chemistry (1963, 1966).

STRELIOFF, Mac G., DDS (Alberta), MS (Columbia), Lecturer in Dentistry (1962, 1962).

STRETCH, Roger George Andrew, BA (Nottingham), PhD (Sheffield), Associate Professor of Psychology (1965, 1965).

STROMSMOE, Keith Allan, BSc (Alberta), MSc (New Brunswick), Assistant Professor of Electrical Engineering (1963, 1963).

STUART, Robert Douglas, MB ChB MD DPH (Aberdeen), FRCP (Glasgow), Director of Provincial Laboratory of Public Health and Provincial Bacteriologist (1949, 1950).

STUART, William Ross, DDS (Alberta), Sessional Lecturer in Dentistry (1964, 1964).

SUBBARAO, Suseela, BA (Andhra Pradesh), MA (Missouri), MALS (Wisconsin), Library Assistant (1965, 1965).

SUCHOWERSKY, C. N., D Iur et Rer Pol (Czernowitz), MLS (Washington), Library Assistant (Cataloguing), (1960, 1960).

SUTTON, Juliet Sylvia, BA (Oxon), MA PhD (Alberta), Assistant Professor of English (1965, 1965).

SWALLOW, Robert James, BA (Saskatchewan), MD (Alberta), Associate Professor of Pathology (1961, 1964).

SWARZ, Paul, AB (Buffalo), AM (Stanford), PhD (Rochester), Associate Professor of Psychology (1965, 1965).

SYCHUK, Maurice Jerry, BA LLB (Saskatchewan), Assistant Professor of Law (1966, 1966).

TAIT, Robert James, BSc (Glasgow), Assistant Professor of Mathematics (1962, 1962).

TAMAOKI, Taiki, BS (Tokyo), MS (Purdue), PhD (Wisconsin), Assistant Professor of Biochemistry (1964, 1965).

TANNAHILL, Miss Grace Dunsmore, BSc BA (Saskatchewan), Lecturer, School of Nursing (1965, 1965).

TAYLOR, Jack Dean, MSc (Alberta), PhD (Saskatchewan), Assistant Professor of Pharmacology (1957, 1960).

TAYLOR, John Benjamin, OACA (Toronto), Associate Professor and Acting Head of Art (1947, 1966).

TAYLOR, Russell Frederick, BSc MD (McGill), FRCP(C), Assistant Professor of Medicine (1966, 1966).

TAYLOR, William Clyne, MB ChB (Aberdeen), FRCP(C), Associate Professor of Paediatrics and Honorary Instructor in Pathology (1957, 1959).

TEDESCHINI, Mario Isidor, BSc MD (Alberta), Instructor in Paediatrics (1957, 1962).

TENNESSEN, Herman, Magister Artium (Oslo), Associate Professor of Philosophy (1961, 1961).

TERFLOTH, John H., BA (Alberta), MFA (Carnegie), PhD (Iowa), Associate Professor of Drama (1966, 1966).

THEMAN, Adolph Edward, MD (Manitoba), FRCS(C), Lecturer in Surgery (1957, 1963).

THEODORE, Jules A., DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

THOMAS, Lewis Gwynne, MA (Alberta), PhD (Harvard), Professor of History (1938, 1958).

THOMAS, Lewis Herbert, MA (Saskatchewan), PhD (Minnesota), Professor and Chairman of History (1964, 1965.)

THOMPSON, Andrew Cecil, BSc DDS (Alberta), Sessional Instructor in Prosthetic Dentistry (1960,1960).

THOMPSON, Andrew Royden, LLB (Manitoba), LLM (Toronto), Professor of Law (1950, 1963).

THOMPSON, Donald Neil, BCom (Manitoba), MBA (Berkeley), Asscociate Professor of Commerce (1962, 1966).

THOMPSON, Robert Kenneth Colquoun, BSc MD (Alberta), FACP, Clinical Professor of Medicine (1939, 1950).

THOMSON, Keith Heathcote, MA BEd (Alberta), EdD (California), Associate Professor of Educational Foundations (1960, 1960).

THOMSON, Stanley, BASc (Toronto), MSc PhD (Alberta), Associate Professor of Civil Engineering (1961, 1963).

THURSTON, Olin Gavin, BA MD (Saskatchewan), FRCS(C), Clinical Instructor in Surgery (1966, 1966).

TOOGOOD, John Alfred, BSc (Alberta), PhD (Minnesota), Professor and Head of Soil Science (1948, 1959).

TOOP, Edgar Wesley, BSA (British Columbia), MSc PhD (Ohio State), Assistant Professor of Plant Science, (1962, 1962).

TOSHACH, Miss Sheila, BScHEc (Alberta), MA (Toronto), Assistant Professor of Bacteriology (1957, 1957).

TOWNSEND, Edith Edgecombe, MSc PhD (McGill), Assistant Professor of Biochemistry (1962, 1962).

TOWNSEND, Gordon, BSc (Saskatchewan), MD CM (McGill), Instructor in Surgery (1964, 1964).

TRETIAK, Salomea, BA (Manitoba), MA (Columbia), Assistant Professor of Nursing (1961, 1961).

TROLLOPE, John Reginald, MSc PhD (Alberta), Assistant Professor of Mathematics (1964, 1964).

TROLLOPE, Mrs. Zennia Montana, MSc (Alberta), Assistant Professor of Mathematics (1958, 1961).

TRUMPENER, Ulrich, BA (Oregon), MA PhD (Berkeley), Assistant Professor of History (1966, 1966).

TUBA, Jules, MSc (Saskatchewan), PhD (Toronto), Professor of Biochemistry (1942, 1952).

TUCKER, Gordon Neil, MD (Toronto), Lecturer in Surgery (1938, 1948).

TURNER, Edward J., MD BSc PhD (Malta), DRCOG DCH MMSA (London), Instructor in Paediatrics (1963, 1964).

TURNER, George Godfrey, BA (McGill), LLB (British Columbia), BLS (Toronto), Assistant Librarian (1964, 1964).

URSCHEL, Albert R., DDS (Alberta), Lecturer in Dentistry (1958, 1958).

VAN ALSTINE, Robert Stacey, DDS (Alberta), MS (Michigan), Associate Professor and Head of Surgery-Periodontia (1953, 1961).

VANDEN BORN, William Henry, MSc (Alberta), PhD (Toronto), Ascociate Professor of Plant Science (1961, 1966).

VANDER WELL, Allen Richard, MA (Iowa), Counsellor in Student Counselling Services, Assistant Professor of Educational Psychology (1960, 1960).

VAN DE PITTE, Frederick P., PhB (Detroit), PhD (S. California), Assistant Professor of Philosophy (1966, 1966).

VAN STOLK, Jan Bertram, MB CHB (Cape Town), Clinical Instructor in Psychiatry (1965, 1965).

VAN VLIET, Maurice Lewis, MS (Oregon), EdD (California), Dean, Faculty of Physical Education (1945, 1964).

VENART, James E. S., BSc (Toronto), Assistant Professor of Engineering (1964, 1964).

VENNE, J. M., DDS (Alberta), Sessional Lecturer in Dentistry (1961, 1961).

VERDINI, Livio, Dottore in Fisica (Trieste), Libera Docenza (Rome), Associate Professor of Physics (1966, 1966).

VERSCHUREN, Jacobus Petrus, Ir (Delft), MSc (Alberta), Associate Professor of Civil Engineering (1954, 1961).

VITOVEC, Franz H., Dip Ing, Dr Tech Sci (Technische Hoschschule, Vienna), Professor of Mining and Metallurgy (1965, 1965).

VOICE, Miss Margaret I., BA (Alberta), BLS (Toronto), Library Assistant (1963, 1963).

WAIT, Richard Harvey, MD (McGill), FRCP(C), Instructor in Clinical Medicine (1964, 1964).

WALKER, Bernal Ernest, MA (Alberta), PhD (Stanford), Professor and Head of Educational Foundations (1947, 1961).

WALKER, George Brown, MA (Glasgow), PhD (London), Professor and Head, Electrical Engineering (1964, 1964).

WALKER, George William Rutherford, MA (Saskatchewan), PhD (McGill), Professor of Genetics (1954, 1965).

WALLEY, Roc Edward, AB PhD (Berkeley), Assistant Professor of Physiology (1963, 1963).

WARD, Mrs. Josephine Hendry, RN (Alberta), Assistant Infirmary Nurse (1946, 1946).

WARE, Robert Livingston, MMusEd (Southern Mississippi), Assistant Professor of Elementary Education (Music) (1964, 1964).

WARWARUK, Joseph, BSc (Alberta), MS PhD (Illinois), Associate Professor of Civil Engineering (1960, 1962).

WATSON, Mrs. Sheila Martin, MA (British Columbia), Assistant Professor of English (1961, 1962).

WATSON, Walter Bingham, BA (Southern Methodist), MS PhD (Wisconsin), Associate Professor of Sociology (1965, 1965).

WATSON, Wilfred, BA (British Columbia), MA PhD (Toronto), Professor of English (1951, 1965).

WEBSTER, Anthony John Francis, MBVet MA (Cantab), Assistant Professor of Animal Physiology (1966, 1966).

WEBSTER, Gordon Ritchie, MSA (British Columbia), PhD (Oregon), Associate Professor of Soil Science (1960, 1963).

WECKOWICZ, Tadeusz Eugenieus, MBChB (Polish School, University of Edinburgh), DPM (Leeds), PhD (Saskatchewan), Assistant Professor of Psychology and Psychiatry (1963, 1963).

WEICHMAN, Frank Ludwig, BS (Brooklyn), PhD (Northwestern), Associate Professor of Physics (1958, 1963).

WEIJER, Jan, DSc (Groningen), Professor of Genetics (1957, 1960).

WEINLOS, Chaim Harry Wolf, BA MD (Alberta), FRCS(C), Lecturer in Surgery (1949, 1963).

WEIR, Mary S., BSc (Glasgow), PhD (Berkeley), Assistant Professor of Chemistry (1962, 1963).

WEIR, Normal William Ferguson, MB ChB (Belfast), BOA MRCOG, Instructor in Ob-Medicine (1964, 1966).

WENSEL, Ronald Harvey, BSc, MD (Alberta), FRCP(C), Instructor in Physiology and Medicine (1964, 1964).

WESTGATE, John Arthur, BSc (Reading), PhD (Alberta), Assistant Professor of Geology (1965, 1965).

WESTLAKE, Donald William Speck, MSc (British Columbia), PhD (Wisconsin), Associate Professor of Microbiology (1966, 1966).

WHIDDEN, John MacLean, BCom (Alberta), Bursar (1947, 1947).

WHITE, Miss Alison Genevieve, EdB (Eastern Illinois), AM (Ohio), MA (Bread Loaf), PhD (State University of Iowa), Associate Professor of English (1955, 1961).

WHITING, Robert Harvey, BA (Toronto), MD CM (McGill), FACP FRCP(C), Associate Clinical Professor in Medicine (1947, 1964).

WHITNEY, Eoin, BSc (Alberta), AM PhD (Harvard), Associate Professor of Mathematics and of Computing Science (1957, 1959).

WHYTE, James Howden, BSc (Edinburgh), MSc PhD (McGill), Professor of Botany, Director of the Botanical Garden and Field Laboratory (1939, 1958).

WICKENDEN, John Nicholas, BA (Alberta), BA (Cantab.), Assistant Professor of History (1962, 1963).

WIEDRICK, Laurence George, BA (Saskatchewan), BLS (Toronto), BEd (Alberta), Associate Professor of Elementary Education (School Libraries) (1964, 1966).

WILBERG, Robert Bernard, BEd (Alberta), MS (Oregon), Assistant Professor of Physical Education (1966, 1966).

WILCOCK, Peter F., BSc (Bishop's), MD CM (McGill), Instructor in Paediatrics (1965, 1966).

WILKINSON, David, MB BS (London, Eng.), Instructor in Paediatrics (1960, 1964).

WILLIAMS, C. Brian, BCom (British Columbia), MBA (Washington), Associate Professor of Commerce (1964, 1966).

WILLIAMS, Miss Darilyn Ann, Instructor in Pathology (1966, 1966).

WILLIAMS, Gordon Donald Clarence, BSc (Manitoba), PhD (Alberta), Assistant Professor of Geology and Assistant to the Head of Geology (1961, 1966).

WILLIAMS, Henry Thomas Gee, MB ChB (Liverpool), FRCS (England), FRCS(C), Assistant Clinical Professor in Surgery (1958, 1964).

WILLIAMS, Jeremy S., LLB (Sheffield), Assistant Professor of Law (1966, 1966).

WILLIAMS, Robert Tudor, MRCS LRCP (London), Sessional Instructor in Anaesthesia (1965, 1965).

WILLIAMSON, Colwyn T. J., BA (Leeds), BPhil (Oxford), Assistant Professor of Philosophy (1962, 1963).

WILLIAMSON, Donald Munro, BA MD (Alberta), Sessional Instructor in Preventive Medicine (1965, 1965).

WILLIS, Jackson Norman, BA (Manitoba), MSW (McGill), Instructor in Preventive Medicine (1962, 1964).

WILLOX, George Leslie, MD (Alberta), FRCS(C) FACS, Clinical Professor of Surgery (1951, 1957).

WILSON, Derek William Raymond, BSc PhD (Birmingham), Assistant Professor of Secondary Education (1966, 1966).

WILSON, Donald Robert, BA (Oxford), MD CM (McGill), FRCP(C), FACP, Professor and Head of the Department of Medicine (1947, 1954).

WILSON, Gordon Lochead, MD (Alberta), Lecturer in Orthopaedic Surgery (1947, 1956).

WILSON, Kellogg Van Note, MA (Nebraska), PhD (Illinois), Associate Professor of Computing Science and Psychology (1965, 1966).

WILSON, Lewellyn, L., BA (Washington), MA (Northwestern), Associate Professor of Elementary and Secondary Education (1961, 1966).

WILSON, Thomas Charles, MD CM (Queen's), Assistant Clinical Professor in Otolaryngology (1958, 1959).

WILSON, Thomas Sidney, BSc (New Brunswick), MD (Toronto), FRCS(C) FACS, Clinical Professor of Surgery (1949, 1954).

WINDLE, Stanley Charles, BSc MD (Manitoba), Assistant Clinical Professor of Radiology (1963, 1966).

WISHART, Robert Barry, BCom (Toronto), Administrator of Student Awards (1959, 1959).

WOHLFARTH, Harry, DFA (Bonn), Hon PhD (Marconi), FIAL, Extension Assistant Professor of Art (1954, 1958).

WOJCICKI, Henry Marian, MB ChB MD (Edinburgh), Instructor in Psychiatry (1960, 1965).

WONDERS, William Clare, BA PhD (Toronto), MA (Syracuse), Professor and Head of Geography (1953, 1957).

WONG, James Sui-Wing, BSc (Baylor), PhD (California I.T.), Assistant Professor of Mathematics (1964, 1964).

WOOD, Miss Betty Joan, MD (Manitoba), Instructor in Radiology (1961, 1962).

WOOD, Franklin William, MSc (Alberta), Associate Professor of Dairy and Food Science (1946, 1961).

WOOD, Reginald Kenneth,BE (Saskatchewan), MSc (Alberta), PhD (Northwestern), Assistant Professor of Chemical and Petroleum Engineering (1966, 1966).

WOODS, Stuart Brownlee, MA (Saskatchewan), PhD (British Columbia), Professor and Assistant Chairman, Department of Physics (1959, 1965).

WORTH, Walter Holmes, MEd (Alberta), EdD (Illinois), Professor and Head of Elementary Education (1955, 1961).

WRIGHT, Gerald Howard, BA (Sir George Williams), Assistant Professor in Extension (1963, 1963).

WRIGHT, Maxwell, MA (Queen's, Belfast), Assistant Professor of Philosophy, (1965, 1965).

WYMAN, Max, BSc (Alberta), PhD (California Institute of Technology), FRSC, Professor of Mathematics and Vice-President (1943, 1964).

WYSOCKI, George P., DDS (Alberta), Sessional Lecturer in Dentistry (1963, 1963).

YAMAMOTO, Tatsuso, MSs (Alberta), PhD (Yale), Associate Professor of Microbiology (1962, 1966).

YATES, Edward Norman, AOCA (Toronto), Associate Professor of Art (1954, 1964).

YONEDA, Yoshitaro, MD (Alberta), FRCS(C) FACS, Assistant Clinical Professor of Obstetrics and Gynaecology (1955, 1962).

YONGE, Keith Arnold, MD CM (McGill), DPM (London), Professor and Head of Psychiatry (1957, 1957).

YOUNG, Bryan Sidney, BSc (London), BSc (Oxford), Assistant Professor of Botany (1965, 1965).

YOUNG, John Edward M., DDS (Alberta), Sessional Lecturer in Dentistry (1961, 1961).

YOUNG, McLean Kenneth, MD (Alberta), Lecturer in Medicine (1949, 1964).

YULE, David Lloyd George, BA (British Columbia), MA (Toronto), Associate Professor of Extension (1954, 1954).

ZALESKY, Nicholas, MD (Prague and Lwow), Lecturer in Medicine (1954, 1959).

ZALIK, Mrs. Sara Eisenberg, MS (Mexico), PhD (Illinois), Assistant Professor of Zoology (1966, 1966).

ZALIK, Saul, BSA MSc (Manitoba), PhD (Purdue), Professor of Plant Science (1952, 1964).

ZIEL, Henry Richard, BSc (N.Y. State College), MS (Cornell), EdD (Wayne State), Professor and Head of Industrial and Vocational Education (1962, 1962).

ZINGLE, Harvey Wilfred, MEd PhD (Alberta), Assistant Professor of Educational Psychology (1964, 1964).

ZUJEWSKYJ, Oleh, MA PhD (Pennsylvania), Assistant Professor of Russian (1966, 1966).

ZYTARUK, George John, BEd BA MA (Alberta), Assistant Professor of English (1965, 1965).

HONORARY STAFF MEMBERS

BELL, Robert Edward, MD (Alberta), Honorary Lecturer in Medicine.

BRAND, Maurice H., MB BS (Dunelm), Honorary Instructor in Preventive Medicine.

CAIRNS, His Honor Judge Laurance Yeomans, QC, BA LLD (Alberta), Honorary Professor of Law.

CALARESU, Franco Romano, BA (Pavia), MD (Milan), PhD (Alberta), Honorary Assistant Professor of Physiology.

CHEPEHA, Nicholas, BEd MD (Alberta), Honorary Instructor in Community Medicine.

DOLGOY, Max, MD (Alberta), Honorary Instructor in Preventive Medicine.

FORD, The Honorable Frank, QC, BCL (Trinity), DCL (Toronto), LLD (Alberta and Laval), Honorary Professor of Law.

HALL, Morton Eldred, BA MB (Toronto), Honorary Associate Professor of Pathology.

HAMILTON, Thomas Rochester, BSc MB ChB (Durham), MRCS (England), Honorary Lecturer in Community Medicine.

HERGOTT, Clifford William, MD (Alberta), Honorary Instructor in Community Medicine.

JIMENEZ, José, MD (Madrid), Honorary Lecturer in Rehabilitation Medicine.

KELEMAN, Andor, MD (Pecs), Honorary Instructor in Community Medicine.

KYLE, William Donald, BSc MD (Alberta), Honorary Instructor in Anaesthesia.

LAUERMAN, Joseph M., BSc MD (Alberta), Honorary Instructor in Community Medicine.

LLOYD, Alun, BA MD (Alberta), Honorary Instructor in Community Medicine.

LUCAS, Oscar Nestor, Bachiller, Odontologo (Buenos Aires), PhD (Saskatchewan), Honorary Assistant Professor of Physiology.

MACDONALD, Miss Marie Estelle, BA (Saskatchewan and Manitoba), Honorary Clinical Instructor in Psychiatry (1965, 1965).

MacLEAN, Randall Roberts, MD (Alberta), Honorary Lecturer in Psychiatry.

McPHAIL, William Grant, MD (Alberta), Honorary Instructor in Community Medicine.

MacPHEE, Harry Douglas, MB ChB (Edinburgh), Honorary Instructor in Community Medicine.

MARTLAND, The Honorable Mr. Justice Ronald, BA LLB (Alberta), BCL (Oxford), Honorary Professor of Law.

PARISH, James Gordon, MB ChB MD (Edinburgh), DPM (RCPandS England), Honorary Lecturer in Rehabilitation Medicine.

PEARCE, Mrs. I. Elizabeth, BA MSc PhD (W. Ontario), Honorary Research Associate in Genetics.

QUIGLEY, William Arthur, DDS LDS (Toronto), MS (Michigan), Honorary Professor of Orthodontics.

SCRAGG, Richard Dennison, BSc MD (Alberta), Honorary Instructor in Anaesthesia and Pharmacology.

SNELL, Bernard, LRCP LRCS DPH MRCP (Edinburgh), LRFP&S (Glasgow), Honorary Instructor in Community Medicine.

SOPER, Joseph Dewey, LLD (Alberta), Honorary Research Associate in Zoology.

SPRAGUE, Percy Harry, MD (Alberta), MS (Minnesota), FACP, Honorary Associate Professor of Clinical Medicine.

STEER, George Hobson, QC, MA (Queen's), LLD (Alberta and Queen's), Honorary Professor of Law.

TOWNSEND, Robert Gordon, BSc (Saskatchewan), MD CM (McGill), Honorary Instructor in Surgery.

VARVIS, Christopher James, BSc MD (Alberta), MSc (McGill), Honorary Instructor in Medicine.

WASS, Douglas Keith, BA MSW (Toronto), Honorary Sessional Instructor in Preventive Medicine.

WILLIS, Jackson Norman, BA BSW MSW (McGill), Honorary Instructor in Community Medicine.

YAKE, Wallace, BA (Sask.), MD (Alberta), Honorary Instructor in Community Medicine.

EMERITI

PRESIDENT EMERITUS

ROBERT NEWTON, M.C., B.S.A., M.Sc., Ph.D., D.Sc., LL.D., F.A.I.C., F.R.S.C.

PROFESSORS EMERITUS

CECIL SCOTT BURGESS, F.R.I.B.A., F.R.A.I.C.; Professor Emeritus of Architecture.

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JOHN MALCOLM MacEACHRAN, M.A., Ph.D. (Queen's and Leipzig), LL.D.; Professor Emeritus of Philosophy.

EDGAR STANSFIELD, M.Sc. (Manchester); Research Professor Emeritus.

ROBERT STARR LEIGH WILSON, B.Sc. (McGill); Professor Emeritus of Civil and Municipal Engineering.

JOHN PERCY SACKVILLE, B.S.A. (Toronto), M.S. (Iowa); Professor Emeritus of Animal Science.

EDOUARD SONET, M.A. (Alberta), Docteur d'Universitè (Rennes); Professor Emeritus of Modern Languages.

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MILTON EZRA LAZERTE, B.A. (Toronto), M.A., B.Ed. (Alberta), Ph.D. (Chicago); LL.D. (Alberta); Professor Emeritus of Education.

JOHN MACDONALD, M.A., D.Litt. (Edinburgh); Professor Emeritus of Philosophy.

FRANCIS OWEN, M.A. (Toronto), Ph.D. (Chicago); Professor Emeritus of Modern Languages.

KARL ADOLPH CLARK, M.A. (McMaster), Ph.D. (Illinois); Professor Emeritus of Metallurgy.

HEBER CARSS JAMIESON, M.B. (Toronto), F.R.C.P.(C); Professor Emeritus of Clinical Medicine.

HOWARD HAVELOCK HEPBURN, M.C., M.D., C.M. (McGill), F.R.C.S. (Edinburgh), F.A.C.S., F.R.C.S.(C); Professor Emeritus of Surgery.

HERBERT EDGAR SMITH, B.A. (Illinois), M.A., M.Ed. (Alberta), Ph.D. (California); Professor Emeritus of Education.

PERCIVAL SYDNEY WARREN, B.A. (Toronto), A.R.C.S. (London), Ph.D. (Toronto), F.R.C.S.; Professor Emeritus of Geology.

MABEL PATRICK, B.A. (Toronto), M.A. (Columbia), LL.D. (Alberta); Professor Emeritus of Household Economics.

LAWRENCE HOWARD NICHOLS, B.A. (McGill), M.A. (Alberta), F.R.Met.S.; Professor Emeritus of Physics.

MALCOLM ROSS BOW, B.A., M.D., C.M. (Queen's), D.P.H. (Toronto); Professor Emeritus of Preventive Medicine.

DOUGLAS BURROWS LEITCH, M.C., B.A., M.D. (Toronto), F.R.C.P.(C); Professor Emeritus of Paediatrics.

WILLIAM SCOTT HAMILTON, D.D.S. (Toronto), F.A.C.D., F.D.S.R.C.S. (England); Professor Emeritus of Oral Surgery.

HAROLD RAY THORNTON, B.Sc. (Alberta), Ph.D. (Wisconsin); Professor Emeritus of Dairy Science.

EVANGELINE ALBERTA HASTIE, B.A. (Toronto); Associate Professor Emeritus of Physical Education.

JOHN WILLIAM SCOTT, M.D., C.M. (McGill), F.R.C.P.(C), F.A.C.P.; Professor Emeritus of Medicine.

JOHN EDLESTON BOWSTEAD, M.Sc., Ph.D. (Wisconsin); Professor Emeritus of Animal Husbandry.

HUGH ALTON MacGREGOR, B.Sc. (Alberta), M.Sc. (Cornell), Ed.D. (Oregon State College); Professor Emeritus of Education.

MARK ROBERT MARSHALL, M.M., M.D., C.M. (McGill), D.L.O. (England), F.R.C.S.(C), F.A.C.S.; Professor Emeritus of Ophthalmology.

RALPH FAUST SHANER, Ph.B. (Lafayette), Ph.D. (Harvard), F.R.S.C.; Professor Emeritus of Anatomy.

ALEXANDER JOSEPH COOK, B.Sc. (Alberta), M.A. (Harvard), Ph.D. (Chicago), Professor Emeritus of Mathematics.

WILLIAM DEWAR McDOUGALL, M.A. (Alberta), Ed.D. (Columbia), Professor Emeritus of Education.

MAIMIE SHAW SIMPSON, M.Sc., M.Ed., (Alberta), Professor Emeritus of Education.

HAZEL McINTYRE, B.Sc (Alberta), M.S. (Ames), Professor Emeritus of Household Economics.

ARTHUR WELLESLEY CAMPBELL HENRY, M.S.A. (Saskatchewan), Ph.D. (Minnesota), Professor Emeritus of Plant Science.

JOHN DAWSON NEWTON, B.S.A. (McGill), Ph.D. (California), Professor Emeritus of Soil Science.

ERNEST SYDNEY KEEPING, B.Sc., A.R.C.S. (London), D.I.C., Professor Emeritus of Mathematics.

ANDREW LEO DOUCETTE, B.Sc. (Dalhousie), M.A. (Alberta), D.Ed. (Stanford), Professor Emeritus of Education.

JOHN ROSS VANT, B.A. (Saskatchewan), M.D. (Manitoba), F.A.C.S., F.A.C.O.G., F.R.C.S.(C), F.R.C.O.G., Professor Emeritus of Obstetrics and Gynaecology.

HERBERT EDWARD RAWLINSON, M.D. (Alberta), M.Sc., Ph.D. (McGill); Professor Emeritus of Anatomy.

SPERRY DAVID FRASER, D.D.S. (Alberta), F.A.C.D.; Professor Emeritus of Prosthetic Dentistry.

JOHN THOMAS JONES, M.A. (Alberta and Oxford), Professor Emeritus of English.

REUBEN BENJAIMAN SANDIN, M.A. (Alberta), Ph.D. (Chicago), F.R.S.C., Professor Emeritus of Chemistry.

WILLIAM GEORGE HARDY, M.A. (Toronto), Ph.D. (Chicago), F.I.A.L., Professor Emeritus of Classics.

HUGH GRAYSON-SMITH, M.B.E., M.A., Ph.D. (Toronto), F.R.S.C., Professor Emeritus of Physics.

HENRY GEORGE GLYDE, A.R.C.A. (London), R.C.A., Professor Emeritus of Fine Arts.

POST-DOCTORAL FELLOWS

Biochemistry

AVRAMDVIC, Olga, Ph.D. (Belgrade), July 1966-July 1967.
IGARASHI, Satomi, Ph.D. (Tohoku), July 1966-July 1967.

Botany

BROWN, Malcolm Lovell, Ph.D. (London), October 1966-October 1967.

Chemical and Petroleum Engineering

DEO, Arvind Vinayak, Ph.D. (Poona), October 1966—October 1967.
KOIDE, Kozo, D.Eng. (Tokyo Institute of Technology), September 1966-September 1967.

Chemistry

BARTON, Sydney Charles, Ph.D. (Toronto), April 1966-April 1967.
CHIN, Clinton Gordon, B.Sc., D.Phil (Oxford), September 1966-September 1967.
JOSEPH, Thazhuthaveetil Chacko, Ph.D. (Poone), April 1966-April 1967.
KATO, Masahiko, B.A., M.Sc., Dr.Sc. (Osaka City), January 1966-January 1967
ROBINSON, Maurice Gavin, Ph.D. (Durham), April 1966-April 1967.
SHARMA, Moheswar, Ph.D. (Calcutta), April 1966-April 1967.
TYERMAN, William James Buell, Ph.D. (Cambridge), April 1966-April 1967.

Civil Engineering

LICHARDUS, Svetozar, C.Sc. (Bratislava), September 1966-September 1967.
RAKOCZI, Laszlo, D.Eng. (Budapest), September 1966-September 1967.

Dairy and Food Science

BACIC, Branka, Ph.D. (Novi Sad), April 1966-April 1967.
VUJICIC, Ovica, Ph.D. (Belgrad), August 1966-August 1967.

Educational Administration

FRIESEN, David, Ph.D. (North Dakota), July 1966-July 1967.

Educational Psychology

CUIZON, Erlinda Asuncion, D.Ed. (Indiana), October 1966-October 1967.

Electrical Engineering

POZWOLSKI, Alexandre, D.d'U. (Sorbonne), August 1966-August 1967.
SANG, Emmanual, D.Phil. (Oxford), September 1966-September 1967.

Entomology

FRANK, Jahn Howard, D.Phil. (Oxford), October 1966-October 1967.

Genetics

DRONAMRAJU, Krishna, Ph.D. (Indian Statistical Institute), July 1966-July 1967.

Geology

FRITZ, Peter, D.Rer. Nat. (Stuttgart), October 1966-October 1967.
SASAKI, Akiro, D.Sc. (Tokyo), June 1966-June 1967.

Mathematics

GANDHI, Jeet Mal, Ph.D. (Rajasthan), September 1966-September 1967.
KAYANDE, Anilchandra Ambadas, Ph.D. (Marathwada), September 1966-September 1967.
MURTY, U. S. R., Ph.D. (Indian Statistical Institute), January 1967-January 1968.
VARMA, Arun Kumar, Ph.D. (Calgary), September 1966-September 1967.

Mechanical Engineering

TOMAR, Jangjeet Singh, Ph.D. (Roorkee), September 1966-September 1967.

Mining and Metallurgy

FUKUSHIMA, Seitaro, D.Eng. (Tohoku), August 1966-August 1967.

Pharmacology

TU, Tsuchik, D.M.Sci. (Kyoto), August 1966-August 1967.
VEDANARAYANAN, Perinkulam Viswanathan, Ph.D. (Liverpool), July 1966-July 1967.
VOHRA, Man Mohan), Ph.D. (Banaras Hindu), October 1966-October 1967.

Pharmacy

PARULKAR, Anilkumar Prabhakar, Ph.D. (Washington State), August 1966-August 1967.

Physical Education

SINGH, Mohan. D.Phys.Ed. (Springfield College), July 1966-July 1967.

Physics

*BALLENTINE, Leslie E., Theoretical Physics Institute, Ph.D. (Cambridge), August 1966-August 1967.
*LOLY, P. D., Theoretical Physics Institute, B.Sc.Hons., Ph.D. (London), August 1966-August 1957.
NABETANI, Sachio, B.S., Ph.D., (Tohoku), September 1966-September 1967.
*PRUGOVECKI, Eduard, Theoretical Physics Institute, Ph.D. (Princeton), August 1966-August 1967.
SATO, Kazuo, Ph.D. (Tokyo), April 1966-April 1967.
*SHARMA, Reshav C., Theoretical Physics Institute, B.Sc., M.Sc., Ph.D. (Allahabad) August 1966-August 1967.
STINSON, Glen, Ph.D. (McMaster), July 1966-July 1967.
TANG, Seung Mun, Ph.D. (Indiana), September 1966-September 1967.
WOOD, David Walter, Ph.D. (London), September 1966-September 1967.
WRIGHT, Laurie Stuart, Ph.D. (Carleton), July 1966-July 1967.
*ZUKOTYNSKI, Stefan, Theoretical Physics Institute, (Warsaw), August 1966-August 1967.

Physiology

MORIWAKI, Chiaki, Ph.D. (Tokyo), November 1966-November 1967.

Plant Science

PATON, David, Ph.D. (Strathclyde), August 1966-August 1967.

Political Science

FISCHER, Gabriel, d.en droit. (Debrecen), September 1966-September 1967.

Psychology

JOSHI, Purushottam, Ph.D. (Luchnow), October 1966-October 1967.
MOROZ, Myron, Ph.D. (Oregon), September 1966-September 1967.

Slavonic Languages and Literatures

BILODID, Alexander Ivanovich, Cand. Phil. Sci. (Kiev), September 1966-September 1967.

Soil Science

CLARK, Gavin, Ph.D. (Edinburgh), October 1966-October 1967.

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*Theoretical Physics Institute.

ACADEMIC COSTUME

All gowns are to be of the customary Cambridge shape, i.e., for undergraduates, a gown of black material not falling below the knee with round sleeve cut above elbow; for bachelors, a gown of black material falling below the knee with full sleeve cut to elbow and terminating in a point; for masters, doctors of medicine and doctors of dental surgery a gown of black material falling below the knee with black sleeves with semi-circular cut at bottom.

Hoods are to be of the Oxford pattern, and of spruce green material.

The bachelor's hood is to have a border (1½ inches wide), the master's a full lining, of the color distinctive of the faculty. The M.D. and D.D.S. hoods are to be of the master's pattern.

The faculty colors are:

For Arts (including LL.D.)	White
For Science	Gold-yellow
For Agriculture	Pale Blue
For Commerce	Silver Gray
For Dentistry	Maroon
For Divinity	Purple
For Education	Royal Blue
For Engineering	Light Green
For Household Economics	Pink
For Law	Scarlet
For Medicine	Crimson
For Nursing (B.Sc.)	Crimson and White
For Pharmacy	Cinnamon
For Physical Education	Royal Blue and Gold

Doctors' gowns (Ph.D., Ed.D., D.Sc. and D.Litt.) are to conform to the Intercollegiate Code in design. They are to be of black material and the velvet trim is to be *Philosophy blue* for the Ph.D., *Education light blue* for the Ed.D., *Science gold-yellow* for the D.Sc and *Letters white* for the D.Litt.. Doctors of Laws are entitled to wear a full-dress scarlet robe faced with white silk.

All doctor's hoods (Ph.D., Ed.D., D.Sc. and D.Litt.) are to conform to the Intercollegiate Code in shape, size and color. They are to be of black material to match the gown, and the full lining is to be of gold satin with a six-inch green satin chevron. The velvet trim distinguishes the four degrees and matches the velvet trim on the gown. There is to be a narrow green piping where the gold lining joins the black material. The LL.D. hood is of scarlet silk and of the Cambridge form and has a full lining of white silk.

All caps are to be of the ordinary black trencher shape with black tassels, with a black velvet cap with gold cord for LL.D. full dress.

THE DEGREE OF BACHELOR OF DIVINITY

By an arrangement with St. Stephen's College, the degree of Bachelor of Divinity is offered by the University to graduates in the Faculty of Arts and Science. Admission to the B.D. program is open only to students who have completed a minimum of one year's study in Theology. The course of study is prescribed by the College and must be approved by the General Faculty Council Committee on the Bachelor of Divinity degree. The number of courses which may be taken extramurally in a winter session is restricted to two. In all courses taken toward the B.D. degree the pass mark is 65%. No supplemental examinations are permitted.

In the case of a student unknown to the Faculty of St. Stephen's College, or one who has allowed considerable time to elapse since taking his theological course, it shall rest with the Committee on the B.D. degree to decide whether, before being accepted as a candidate, he shall be required to take one of the following: (a) some intramural studies, or (b) a preliminary comprehensive examination.

For further information regarding this course, application should be made to the Registrar.

THE UNIVERSITY LIBRARIES

Library service is given from four libraries: Rutherford Library, the Cameron Library, the Education Library, and the Physical Sciences Library.

The Rutherford Library building contains the Undergraduate Library and the Law Library. The former consists of a basic collection of 25,000 of the most used books in courses offered to undergraduate students. The books are in the open access main reading room and the closed access reserve reading room. Unsupervised reading rooms are provided for late study in the building. The Law Library is on the first floor and is primarily for the use of students registered in the Faculty of Law.

The main book collection is housed in the Donald Ewing Cameron Library which is intended primarily for the use of senior and graduate students. The first floor is an information centre with the Union Catalogue hall and bibliographic room, the Reference and Periodical Rooms, and the Main Circulation desk. The ground floor houses special services, namely, rare books, micromaterials, documents, maps, and photoservices. The main book collection is arranged on Floors Two to Five as follows: Social Sciences, Humanities, Sciences, and Medical Sciences.

The Physical Sciences Library is located on the ground floor in the north east corner of the Physical Sciences building, and houses a collection of 15,000 volumes for the use of senior students in Chemistry, Mathematics, and Physics.

The Education Library occupies the two-storey east wing of the Education Building, and has a collection of nearly 50,000 volumes relating to education.

The libraries of the University of Alberta in Edmonton contain over 500,000 accessioned volumes, some 125,000 government documents and a growing collection of research materals in microfilms, and subscribe to over 5,000 periodicals. The libraries are adding over 75,000 volumes per year.

PROFESSIONAL STAFF

B. B. PEEL, M.A. (Saskatchewan), B.L.S. (Toronto); Librarian to the University.

S. HARLAND, M.A. (Leeds), F.L.A. (England); Assistant Librarian.

G. G. TURNER, C.D., B.A. (McGill), LL.B. (Baritish Columbia), B.L.S. (Toronto); Assistant Librarian.

DOROTHY I. HAMILTON, B.A. (Alberta), B.Sc. in L.S. (Washington), A.M.L.S. (Michigan); Rare Books Librarian.

NORMA E. FREIFIELD, B.A. (Alberta), B.L.S. (Toronto); Circulation Librarian.

LILLIAN E. M. LEVERSEDGE, B.A. (Alberta), B.L.S. (Toronto); Order Librarian.

EMMA MacDONALD, B.A. (British Columbia), B.L.S. (Toronto); Science Librarian.

D. NODEN, M.A. (Cantab.), B.L.S. (McGill); Chief Cataloguer.

PHYLLIS RUSSELL, B.A. (Alberta), B.L.S. (Toronto); Medical Librarian.

MARGARET V. AUXIER, B.A. (Alberta); B.L.S. (Washington); Reference Librarian.

MARGARET FARNELL, B.A. (Alberta), B.S. in L.S. (Simmons); Undergraduate Librarian.

E. G. OLSON, B.A. (Saskatchewan), B.L.S. (McGill); Periodicals Librarian.

M. L. SHARMA, B.A. (Lucknow), Dip.L.S. (Benares), M.S.L.S. (Western Reserve); Education Librarian.

PATRICIA J. COFFMAN, LL.B. (Cumberland), B.A. (Peabody), M.A.L.S. (Peabody), LL.M. (New York); Law Librarian.

YVONNE FENTON, B.A. (Dunelm), A.L.A. (England); First Assistant (Cataloguing).

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A. KANTAUTAS, B.Com. (Copenhagen), M.L.S. (Washington); First Assistant (Orders).

C. N. SUCHOWERSKY, D. Jur. et Rer. Pol. (Czernowitz), M.L.S. (Washington); Library Assistant (Cataloguing).

FRANCES MIELKE, B.A. (Manitoba), B.L.S. (Toronto); Library Assistant (Education).

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T. MENG, B.A. (Taiwan), LL.M. (Taiwan), B.L.S. (Ottawa), Library Assistant (Orders).

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RACHEL CHEN, B.S. (Taiwan), M.A. (Wesleyan), M.L.S. (Peabody); Library Assistant (Cataloguing).

SIEGLINDE E. ROONEY, B.A. (Saskatchewan), B.L.S. (Toronto); Library Assistant (Education).

HELEN M. SMITH, B.A. (Queen's), B.L.S. (British Columbia); Library Assistant (Orders).

M. M. DUNCAN, B.A., B.L.S. (British Columbia); Library Assistant (Circulation).

JEANNETTE PYRCH, B.A. (Alberta), M.L.S. (Simmons); Library Assistant (Cataloguing).

G. GRLICA, B.A. (Zagreb), M.L.S. (Indiana); Library Assistant (Orders).

MARJORIE J. HOWELL, B.A. (Victoria), B.L.S. (British Columbia); Library Assistant (Reference).

KATHERINE L. MUNRO, B.A., B.L.S. (British Columbia), Library Assistant (Medical).

KAREN L. CHA, B.A., B.L.S. (British Columbia), Library Assistant (Reference).

AUDREY L. SWANSON, B.A. (Alberta), B.L.S. (British Columbia); Library Assistant (Science).

DEPARTMENT OF EXTENSION

The purpose of the Department of Extension is to bring the facilities of the University within the reach of every citizen of the Province. To this end it cooperates with individuals and organizations in projects which advance the social, economic and cultural standards of the community.

Staff:

DUNCAN DARROCH CAMPBELL, B.Com., B.A. (British Columbia), M.A. (Alberta); Professor and Director of Extension.

GLEN ALLENBY EYFORD, B.A. (Manitoba), M.A. (Toronto); Associate Professor and Assistant Director.

DONALD ASA BANCROFT, B.Sc., M.A. (Alberta); Associate Professor in Public Administration.

CHARLES McDONALD LOCKWOOD, B.A.Sc. (Toronto), Dip. Bus. Adm. (Western Ontario); Associate Professor.

DAVID LLOYD GEORGE YULE, B.A. (British Columbia), M.A. (Toronto); Associate Professor.

JOSEPH EDWARD MULLOY, B.A., B.Com. (NUI), C.A.; Assistant Professor in Public Administration.

THOMAS ALFRED PETERSEN, B.Sc. (Alberta), M.A. (Washington), Agricultural Supervisor, Assistant Professor.

JAMES ALBON SHAW, B.S. (Houston), M.S. (Indiana); Assistant Professor.

GERALD HOWARD WRIGHT, B.A. (Sir George Williams); Assistant Professor.

HARRY WOHLFARTH, D.F.A. (Bonn), Hon. Ph.D. (Marconi); Extension Assistant Professor of Art.

DOUGLAS D. BARRY, A.O.C.A. (Toronto); Extension Assistant Professor of Art.

MARY I. DODDS, B.Com. (Alberta), M.S. (Columbia); Extension Librarian.

MOIRA LATIMER ENGLISH, B.A. (British Columbia), M.L.S. (Washington), Assistant Librarian.

Evening Classes, Short Courses and Conferences

An important part of the work of the Department of Extension is the arrangement in appropriate centres of a wide variety of non-credit evening classes for the general public. To a large extent, these classes reflect the work and study being done in the regular university classes and in most cases the same professors are engaged in teaching. A broad range of subjects is offered including Modern Languages, Social Sciences, Literature and the Humanities, Management Training, Engineering, Physical Sciences, Household Economics and the Fine Arts. Currently, some three hundred different classes are offered each year, usually on a weekly evening basis over a period of ten to twenty weeks. Throughout the province, some 10,000 adults are engaged as students in this program.

The term 'short course' refers to the relatively brief but intensive courses aranged to suit the special needs and interests of professional, technical and other groups throughout the province. These courses may vary in length from three days to two weeks and, through them, information and special training is provided to the business, professional and industrial community. Subjects offered may be of a highly technical nature peculiar to a particular group or more general in scope as for example, problems in the field of human relations.

The Department of Extension has, for many years, assisted various community groups and voluntary organizations throughout the province to arrange conferences, workshops, seminars related to the educational aims of the organization. Courses held in conjunction with rural and urban organizations

have centred on such topics as leadership training, community development, meeting procedures and the administration of organizations. In all of the University's programs of evening classes, short courses and conferences, staff is drawn from the teaching departments of the University and from business and industry.

The development of programs in public affairs is a new addition to the Extension activities of the University. Its purpose is "to increase the ability of adults to form sound, independent and critical judgments on important issues of public policy". Public Affairs programs will include a special series of evening classes, study discussion materials, directed reading programs, conferences and seminars focused on topical issues of local, national and international importance. Through these events, it is hoped to provide a framework within which adults can develop the attitudes, skills, knowledge and perceptions necessary to the making of responsible judgments about important problems facing the nation.

In general, the role of the Department of Extension is to facilitate learning opportunities for adults throughout the province through special courses, classes and consultation. As might be expected, the program of evening classes, short courses and conferences changes to meet the changing needs of interested individuals and organizations.

Public Administration Training Division

The Public Administration Training Division offers instruction in certificate courses in Municipal Administration and Municipal Assessment of four years' duration. In addition, it is responsible for periodic conference-courses of three days' duration held annually at Banff. The training needs of local government officers are met by the Division through a combination of correspondence instruction and tutorial sessions. The tutorial sessions are held at twelve selected points throughout the province. The program emphasis of the Division changes to meet the changing needs of local government employees. A major correspondence-tutorial course in Municipal Accounting and Municipal Planning has been added to the program.

Fine Arts

A lively society needs a vigorous, artistic and creative element within itself. People, young and old, with an urge to create, find encouragement and stimulation in the program of Continuing Education in the Fine Arts courses offered through the Department of Extension. Part-time and full-time specialists in Painting, Ceramics, and Sculpture, as well as in Music and Drama, instruct groups in Edmonton and offer special encouragement to the individual in all forms of the Fine Arts.

Classes of instruction in drawing, water color and oil painting are offered at a number of urban and rural centres throughout the province. Intensive short courses, led by instructors of national and international reputation, are offered mid-year in painting and music. In all classes, individual participation is encouraged with a view to raising technical competence and to nurturing an understanding of the essential role of the arts in life.

Extension Library

The Extension Library provides a service to residents of Alberta who have no public library in their communities. A collection of 54,000 volumes gives special emphasis to the fine arts, continuing education, community leadership, business administration and other fields, and also includes recreational reading for children and adults. Books are sent by parcel post to individuals and families and in boxes of forty volumes to small libraries and community groups of all kinds. The library provides an extensive reference and information service, drawing on inter-library loan when necessary. In addition to this general service, the library closely supports Extension courses in a wide variety of subjects with books, reading lists, periodicals.

Special emphasis is put on the development of directed reading programs using library resources available to both individuals and study groups.

Visual Instruction Division

The Visual Instruction Division provides leadership in the development of audio-visual communication in formal and informal education to educators, individuals and community groups.

The Division provides an audio-visual library including 3,554 16 mm. films, 3,225 filmstrips and 900 recordings, both plate and tape. A variety of projections, recording and playback equipment is available as well. A visual communication laboratory within the Division provides a facility for the preparation of graphics materials for communication purposes in education. It is intended to serve not only teaching staff in regular university classes but as well community groups through consultation, demonstration and instruction, and the preparation of inexpensive visual materials for instruction and program purposes.

An audio-visual information reference file maintained by the Division includes information on sources and availability of audio-visual equipment, materials, utilization of various audio-visual materials, in particular teaching and programming situations, developments in educational television and in program learning. This reference service is designed to serve a wide variety of community groups. In addition, instruction in the technique of audio-visual communication in formal courses on the campus and informal courses across the province is provided.

Group Study and Information Services

Albertans have recognized the value of the information service offered by the Department by an ever-increasing use of these services. The Extension Library provides an information service answering questions of general interest. Through the Agricultural Supervisor, innumerable questions from across the province on specialized topics are answered daily. The Supervisor also distributes bulletins and other publications of interest to those involved in agriculture. The Visual Instruction Division also maintains an information service for special requests concerning audio-visual aids and instruction.

The Department has an interest in the organization of study groups in any section in the province. Living Library and Great Books programs are pro-

moted by departmental personnel by means of assistance with the organization of such groups, counselling on conduct of meetings, leadership and supplying study materials. Programs of directed reading and some few correspondence courses are available on request.

INDUSTRIAL LABORATORIES

The Department of Industrial Laboratories operates fully equipped chemical and physical laboratories for carrying out analyses and tests on all materials. Industrial investigations can be undertaken.

For complete information and schedule of fees, apply to the Director and Provincial Analyst.

JUNIOR COLLEGES

By authority of the Co-ordinating Council of the Universities, junior colleges may be recommended to the Board of Governors for affiliation with the University under the following conditions:

1. **Staff—**
   (a) Number of staff: A minimum staff of six teachers giving the major part of their time to first year junior college work, or ten giving the major part of their time to first and second year junior college work, must be maintained.
   (b) Qualifications of staff: The members of staff teaching only first year courses should hold at least the Master's degree or its equivalent in the main field of instruction; those teaching any second year courses should hold substantially higher qualifications in the appropriate field of instruction.

   All staff members offering instruction at the university level must be approved for appointment by the Committee on Junior Colleges (Under the School Act, all staff members offering instruction in High School work must hold teachers' certificates.)
2. **Curriculum—**
   Courses and programs of studies for university credit must be approved by the Committee on Junior Colleges.
3. **Equipment—**
   Library and laboratory facilities must be adequate in the subjects taught in the junior college.
4. **Admission—**
   The conditions of admission to university courses and programs at junior colleges will be those which obtain in the University of Alberta.
5. **Examinations—**
   The examinations of the junior college in courses offered for university credit will be the regular university examinations in these courses. In addition to Physical Education not more than ten full courses may be offered for university credit by any student taking both first and second years at the junior college.

6. **Financial Support—**
The University of Alberta assumes no responsibility for the financial support of affiliated junior colleges.

7. **Affiliation with Other Institutions—**
Junior colleges affiliated with the University of Alberta may not have or enter into affiliations or accreditation arrangements with other colleges or universities without the permission of the Co-Ordinating Council.

8. **Period of Affiliation Agreement—**
The period of any affiliation agreement shall be five years.

9. **Public Announcements—**
All documents which an affiliated institution proposes to issue for public information and which purport to contain a statement of the institution's relationship with the university or other universities shall be submitted before printing for the approval of the President of the University.

The teaching staffs of the Junior Colleges affiliated under these regulations are:

CAMROSE JUNIOR COLLEGE

GIBSON, W. Garnet, B.P.E. (British Columbia), M.A. (Alberta) ..... Physical Education
MOI, Georg, B.A. (Saskatchewan), M.A. (British Columbia) ..... French and Greek
MORGENROTH, K. G., B.A. (Queen), B.Ed., M.A., M.Ed. (Saskatchewan), Ph.D. (Milton) ..... German, Psychology
OLSON, O. D., B.E. (Saskatchewan), Ph.D. (Saskatchewan) ..... Physics, Mathematics
NEFF, James R., B.Mus. (Concordia), M.A. (Denver) ..... Music
OSTREM, R. J., B.A. (St. Olaf), M.A. (Minnesota) ..... Educational Psychology
PIERCE, Helen, B.Ed. (Alberta), M.A. (Alberta) ..... Educational Foundations
REESOR, Bayard W., B.A., M.A. (Saskatchewan), B.Ed. (Alberta) ..... Economics, Political Science
RUGLAND, Nora, B.A. (St. Olaf), B.Ed. (Alberta) ..... Librarian
SANDERMAN, Erryl J., B.A. Honors (Alberta) ..... Sociology
SHARMAN, Joan, B.A. (Toronto), M.A. (Laval) ..... English
STEBBINS, L. L., B.A., M.Sc. (Maine) ..... Biology

RED DEER JUNIOR COLLEGE

BENNETT, Rober S., B.D. (Alberta), B.Sc., M.Sc. (Marshall, W. Virginia) ..... Chemistry
CAMPBELL, Charles S., B.A., B.Ed., M.Ed. (Alberta), M.A. (Toronto) ..... English
CARNEGIE, Gordon R., B.A., M.A. (Alberta) ..... English
CHURCH, Gordon, B.A., M.A. (Saskatchewan) ..... Economics, Political Science
DOMMERSTERN, Carl A., B.L.S. (Ottawa) ..... Librarian
FALKNER, N. Ward, B.Sc., M.Sc. (Manitoba) ..... Biology
FARTHING, Gilbert, B.A. (London), M.A., M.Ed. (British Columbia) ..... History, Educational Foundations
HEWITT, David S., B.A. (Alberta) ..... Psychology
HULLEMAN, Harm, B.Ed. (Alberta) ..... French
LALOR, Wayne, B.Ed., B.P.E. (Alberta) ..... Physical Education
LONG, John, B.A., Dip.Ed. (Wales) ..... Music
MAH, Shao N., B.Sc. (Arizona), M.Sc. (Idaho), M.Sc. (Oregon) .... Mathematics, Business
O'BRIEN, Richard W., B.Ed., M.A. (Alberta) ..... English
PROUDFOOT, James A., B.Ed., B.A., M.A. (Alberta) ..... Geography, Sociology
RAFFA, Peter, B.A., B.Ed., M.A. (Alberta) ..... Educational Administration
RATTAN, Mohindar S., B.Sc. (Punjab), M.Ed. (Alberta) ..... Educational Psychology
SCHMITKE, Laurel M., B.P.E. (Alberta) ..... Physical Education
THORDARSON, Svenn, Doctor N.Sc. (Jena) ..... Mathematics, Physics
WATKINS, Donald, B.Ed. M.A. (Alberta) ..... French

GRANDE PRAIRIE JUNIOR COLLEGE

ANDERSON, Henry N., B.Ed., B.A. (Alberta) ..... Educational Administration
BATES, George E., B.A. Honors (British Columbia) ..... Psychology
BULCOCK, Jeffrey W., B.A. (Leeds), M.Ed. (British Columbia) ..... Sociology, Educational Foundations
CRISTALL, Daniel R., B.A. (Pomona), M.Sc. (Brown) ..... Physics, Mathematics
HUTTON, Irene, B.A. (Saskatchewan), M.A. (Minnesota), B.Ed. (Alberta) ..... History
JOHNSON, Kelvin T., B.A. (Alberta) ..... English
KNAPP, Marjorie, B.A., B.Ed. (Alberta), M.Ed. (Oregon) ..... Educational Psychology
LEMAY, Paul, B.Sc. (Alberta), M.Sc. (Alberta) ..... Biology
MARSTON, Robert I., B.Sc. (Alberta), M.Sc. (Alberta) ..... Chemistry
REEVES, William J., B.A. Honors (Alberta), M.A. (Indiana) .. Political Science, Economics
WALDENBERGER, Robert W., B.P.E. (Alberta), M.Sc. (Oregon) ..... Physical Education
WOOLLEY, LeRon P., B.Ed. (Alberta) ..... French

AFFILIATED INSTITUTIONS

Certain educational or research organizations in the Province are related to the University either historically, or by resolutions of the University's governing bodies, or for mutual advantage, or in more of these ways than one. The relationship between them and the University is customarily described by the term *Affiliation*. It is a characteristic of such of these institutions as teach or hold examinations that these activities are, in part, directly related to the programs of the University.

THE UNIVERSITY HOSPITAL

The University of Alberta Hospital has a bed capacity of 1,200. The distribution of beds to the various services is fairly uniform. The hospital is administered by a Board appointed by the Lieutenant Governor in Council. Two members of the Board, the President of the University and the Dean of the Faculty of Medicine, are statutory members. Further details may be found in the calendars of the Faculties of Medicine and Dentistry.

From 1922 to 1929 the hospital was administered by the University. Students in Medicine, Dentistry and the degree course in Nursing receive instruction there.

The Hospital Board members are:

Gordon K. Wynn, Esq., Chairman
E. A. D. McCuaig, Esq., Vice-Chairman
E. A. Christenson, Esq.
K. J. Hawkins, Esq.
President Johns
Dean MacKenzie
Mrs. W. F. Bowker
M. Roger Parker, Esq.
Dr. John E. Young

The Medical Superintendent is Dr. B. Snell, M.R.C.P., D.P.H.

ST. STEPHEN'S COLLEGE

St. Stephen's College is the Divinity School of the United Church of Canada in the Province of Alberta. Courses are set out below, and in the earlier statement on the Degree of Bachelor of Divinity.

The College erected its first building on the campus in 1910. It provides courses which are accepted for credit towards University degrees, and houses some 150 students.

Its staff includes the following:

REV. DAVID JOHN CLIFTON ELSON, B.A. (Alberta), M.A. (Columbia), D.D. (St. Andrew's, Saskatoon); Dean, Professor of New Testament Language and Literature.

REV. CHARLES FRANKLIN JOHNSTON, M.A. (McGill), B.D. (U.T.C., Montreal), S.T.M., Th.D. (Union, N.Y.), D.D. (U.T.C., Montreal); Professor of Church History, Librarian, Chaplain of St. Stephen's Residence.

REV. GEORGE LINDSAY VOGAN, B.A., B.D. (Queen's), M.A. (Cambridge); Professor of Old Testament Language and Literature.

REV. TERENCE ROY ANDERSON, B.A., B.D. (Alberta), S.T.M. (Union, N.Y.); Professor of Church and World.

REV. G. M. TUTTLE, B.A., B.D. (Alberta), Th.D. (Toronto); Professor of Christian Theology and Christian Education.

REV. B. D. MOORE, B.Comm., B.D., S.T.M. (Union, N.Y.); Lecturer in Homiletics.

Courses of Study

Three Courses of Study are open to Candidates—

1. "The attainment of a B.A. degree, including Greek, to be followed by three years in the study of Theology, is strongly recommended by the Church. Before ordination every candidate shall spend 12 months in preaching and pastoral work."

or

2. "Three years, at least, in Arts, followed by three years in Theology. Before ordination every candidate shall spend 12 months in preaching and pastoral work."

or

3. "Two years' preaching under the supervision of a Presbytery, with appropriate studies, and four years of a mixed Arts and Theological course in College."

Note:—All courses must start from University matriculation.

Suggested Classes in Arts for Students Selecting Course No. 2

(a) English Language and Literature (three years).

(b) Two languages, one of which must be Greek (two years in each).

(c) Philosophy, including psychology, logic and ethics (two years).

(d) Two other subjects from the Arts curriculum at the option of the student (one year in each).

The Arts Course

English Language and Literature; philosophy, psychology, logic and ethics; one language; and one option from the Arts course.

Theological Course

Homiletics; Pastoral Theology; Systematic Theology; New Testament Language and Literature; Old Testament Literature; English Bible; Church History; Christian Ethics and Sociology; Counselling.

By an arrangement with the University, a course in Biblical Literature is given which is open to students of the University and counts for credit on an Arts course.

Hebrew

George Lindsay Vogan, B.A., B.D. (Queen's), M.A. (Cantab.)

Hebrew offers three courses under the numbers 100, 300 and 400 and is now, with the consent of the Deans of Arts, open to others besides theological students.

Hebrew 100 is the beginners' course on the basic elements of the classical language. Hebrew 300 completes a detailed survey of the basic elements and leads into the essentials for an advanced study of Hebrew syntax at a graduate theological seminary. Hebrew 400 is an extensive reading course.

Hebrew 100. (3-0; 3-0)

Elements of Hebrew—Basic grammar and selected readings from the documentary strata of the Pentateuch.

Hebrew 300. (3-0; 3-0)

Elements of Hebrew Syntax—Basic grammar (continued) with a solid introduction to syntax. Readings from the Prophets and the Writings of the Hebrew Bible.

Prerequisite: Hebrew 100.

Hebrew 400.

Hebrew Syntax and Composition—A seminar and reading course to be arranged with the Dean of St. Stephen's College.

Prerequisite: Hebrew 100 and 300 (or their equivalent).

ST. JOSEPH'S COLLEGE

This College, established under the authority of the Roman Catholic Church, is directed by the Congregation of St. Basil (Basilian Fathers).

The College was affiliated with the University by resolution of the Senate, May 31, 1926. It provides courses which are accepted for credit towards degrees, and houses some 100 students.

Its staff includes the following:

REV. ROBERT M. MONTAGUE, C.S.B., B.A. (Toronto), M.A. (Assumption), Rector of St. Joseph's College.

REV. J. WILFRED DORE, C.S.B., M.A. (Toronto), Ph.D. (Ottawa), Professor of Philosophy.

REV. J. A. SHERIDAN, M.A. (Cantab.), Ph.D., S.T.D. (Gregorian University, Rome), Professor of Christian Apologetics.

REV. R. A. PENDERGAST, C.S.B., B.A.Hons., M.A. (Toronto), Ph.D. (Ottawo), Assistant Professor of Economics.

Cooperating with the University, the College offers instruction in the following courses:

Christian Apologetics

Chr 366 (3-0; 3-0)

Christian Apologetics—Father Montague—A doctrinal and apologetical treatment of the key teachings of Christianity; a survey of the new Testament, the History of the Church, and the Encyclicals.

(This course is an Arts option for Roman Catholic students.)

Philosophy

Phil 242 (3-0; 3-0)

Foundations and Development of Christian Philosophy—Father Dore.

(See Faculty of Arts)

THE WESTERN BOARD OF MUSIC

This board was founded in 1935 in order to conduct examinations of a high standard in Music. In it are associated the Universities and the Departments of Education of Alberta, Manitoba and Saskatchewan.

The organization in Alberta is under the University Committee on Music, and the University awards the diplomas of A.Mus. (Alberta) and L.Mus, (Alberta) for the second highest and the highest grades, respectively, in the various subjects. Passes in certain examinations of the Board are required of students proceeding towards the degree of Bachelor of Music.

Theoretical and practical examinations are held in Alberta in February and the summer of each year.

Further details, including information about prizes and awards, are to be found in the Music Syllabus, or other official publication obtainable from the Western Board of Music, Department of Fine Arts, University of Alberta.

THE RESEARCH COUNCIL OF ALBERTA

This was formed in 1919 by the Province and the University for the general purpose of conducting economic research into the resources of the Province. For many years it was housed in University buildings. Collaboration between the Council and the University continues in a number of fields. The President of the University is a member of the Council.

The staff of the Council includes the following:

Administrative Officers

E. J. WIGGINS, B.Sc. (Queen's), Ph.D. (McGill); Director of Research.
D. K. IRWIN, B.A. (Western Ontario); Administrative Assistant.
KATHLEEN S. WARK, B.Com. (Alberta); Accountant.
M. T. BULMER, B.A. (Sir George Williams), B.L.S. (McGill); Library Supervisor.

Fuels Branch

H. W. HABGOOD, M.Sc. (Queen's), M.S., Ph.D. (Michigan); Chief, **Fuels Branch.**
N. BERKOWITZ, Ph.D. (London); Head, **Coal Division.**
R. A. S. BROWN, B.Sc (Alberta), M.Sc. (California Institute Techonolgy), Ph.D. (Alberta); Engineer.
J. D. CAMPBELL, B.A. (McMaster), M.A. (British Columbia), Ph.D. (McGill); Paleobotanist.
W. DAMMEYER, B.Sc. (Alberta); Chemist.
J. F. FRYER, M.Sc. (Alberta); Chemist.
M. GAWLAK, M.Sc. (London); Chemist.
Z. M. GEORGE, Ph.D. (McGill); Chemist.
E. J. JENSEN, M.Sc. (Copenhagen); Engineer.
N. MELNYK, B.Sc. (Alberta); Engineer.
S. MOSCHOPEDIS, B.Sc. (Athens); Chemist.
J. C. WOOD, B.Sc. (Alberta), Ph.D. (McGill); Chemist.
G. W. HODGSON, M.Sc. (Alberta), Ph.D. (McGill); Head, **Petroleum Division.**
B. L. BAKER, M.Sc. (Alberta); Chemist.
A. T. BLADES, B.Sc. (Western Ontario), M.Sc., Ph.D. (Wisconsin); Chemist.

H .S. ELLIS, B.Sc. (London); Engineer.
B. HITCHON, Ph.D. (Manchester); Geologist.
R. F. KLEMM, Ph.D. (Michigan); Chemist.
J. KRUYER, B.Sc. (Alberta); Engineer.
D. L. MITCHELL, Ph.D. (Queen's); Chemist.
R. NEWTON, B.Sc. (London); Mathematician.
D. S. PASTERNACK, B.Sc. (Queen's), Ph.D. (McGill); Chemist.
P. J. REDBERGER, B.Sc (Moravian College); Mathematician.
G. F. ROUND, Ph.D. (Birmingham); Engineer.
S. W. CREIGHTON, M.A. (Queen's), Ph.D. (Yale); Chemist, **Natural Gas.**
R. M. ELOFSON, B.Sc. (Alberta), Ph.D. (Wisconsin); Head, **Special Fuels Projects.**
T. KANEDA, B.Eng., D.Sc. (Tokyo Institute Technology); Microbiologist.
M. F. MORONEY, B.Sc. (Dublin); Biochemist.
K. F. SCHULZ, Ph.D. (Zagreb), Chemist.
J. S. CHARLESWORTH, B.Sc. (Alberta); Chemist-in-Charge, **Gasoline and Oil Testing Laboratory.**
GLADYS M. STOTT, B.Sc. (Alberta); Chemist.
F. GREEBE, M.Sc. (Delft); Engineer.
M. WORSLEY, M.Sc. (Alberta), Ph.D. (Toronto); Engineer.
S. CHAKRABARTTY, M.Sc. (Brandeis), Ph.D. (Pittsburgh); Postdoctoral Fellow, Organic Chemistry.
JANE O'REILLY, B.Sc. (Montreal); Chemist.
K. YOSHIZAWA, D.Sc. (Tokyo); Postdoctoral Fellow, Microbiology.
B. BARTLEY, Ph.D. (Johns Hopkins); Postdoctoral Fellow, Physical Chemistry.
Y. WATANABE, Ph.D. (Kyoto); Postdoctoral Fellow, Physical Chemistry.

Earth Sciences Branch

R. GREEN, Ph.D. (Dunelm); Head, **Geology Division.**
L. A. BAYROCK, M.Sc. (Alberta), Ph.D. (Wisconsin); Geologist.
M. A. CARRIGY, M.Sc. (West Australia); Sedimentologist.
J. D. GODFREY, B.Sc. (Nottingham), M.Sc., Ph.D. (Chicago); Petrologist.
G. J. GOVETT, B.Sc. (S. Wales), D.I.C., Ph.D. (London); Geochemist.
L. B. HALFERDAHL, M.Sc. (Queen's), Ph.D. (Johns Hopkins); Mineralogist.
G. B. MELLON, M.Sc. (Alberta), Ph.D. (Penn. State); Sedimentologist.
C. SINGH, Ph.D. (Alberta); Geologist.
J. H. WALL, B.S. (New Brunswick), M.Sc. (Alberta), Ph.D. (Missouri); Micropaleontologist.
D. H. LENNOX, B.A. (Toronto), M.Sc. (Alberta); Head **Groundwater Division.**
V. D. CARLSON, B.Sc. (Alberta); Geologist.
G. M. GABERT, B.Sc. (Alberta); Geologist.
K. W. GEIGER, B.Sc. (Alberta), M.S., Ph.D. (Cornell); Geologist.
G. LeBRETON, B.Sc. (Wales); Geologist.
D. R. STEVENSON, B.Sc. (Alberta); Geologist.
O. TOKARSKY, B.Sc. (Western Ontario); Geologist.
J. TOTH, Geol. drs. (R. U. Utrecht); Hydrologist.
A. VANDEN BERG, Geol. drs. (R. U. Utrecht); Geologist.
W. ODYNSKY, M.Sc (Alberta); Head, **Soils Division.**
J. D. DANGERFIELD, B.Sc. (Alberta); Agric.
J. D. LINDSAY, M.S.A. (British Columbia); Soil Surveyor.
L. E. LOWE, M.A. (Oxford), M.Sc., Ph.D. (McGill); Soil Chemist.
S. W. REEDER, M.Sc. (McGill); Soil Surveyor.
M. D. SCHEELAR, B.Sc. (Alberta); Soil Surveyor.
A. WYNNYK, M.Sc. (Alberta); Soil Surveyor.
T. E. BERG, Ph.D. (Wisconsin); Geologist.
PAULINE BABET, B.Sc. (Illinois); Geologist.
W. R. TURNER, B.Sc. (Oklahoma); Geological Engineer.

Highway Research

B. P. SHIELDS, B.Sc. (Manitoba), M.Sc. (Alberta); Head, **Highway Research.**
C. R. NEILL, B.Sc. (Glasgow), M.Sc. (Alberta); Engineer.
H. H. RIX, M.Sc. (Alberta); Engineer.

Industrial Engineering Services

J. GREGORY, M.Sc. (Alberta); Head, **Industrial and Engineering Services.**
A. ANDERSON, B.Sc. (Saskatchewan); Engineer.
J. N. ERGIL, M.Sc. (Pittsburgh); Engineer.
A. FITZPATRICK, B.Sc., M.A. (Alberta); Engineer.

J. A. HOLUB, B.Sc. (Oklahoma); Mechanical Engineer.
V. OSINCHUK, B.Sc. (Alberta); Chemical Engineer.
D. J. SAKELLARIOU, B.Sc. (Athens); Chemist.
S. J. WISKEL, M.Sc. (Alberta); Engineer.
C. ANDERSON, M.Sc. (British Columbia); Mechanical Engineer.

Cloud Physics and Hail Research

P. W. SUMMERS, B.Sc. (Nottingham), D.I.C. (Imperial College), Ph.D. (McGill); Meteorologist.

THE PROVINCIAL LABORATORY OF PUBLIC HEALTH

This institution, which is established both at Edmonton and Calgary, is administered by the University and its senior staff members at Edmonton are members of University teaching departments and conduct certain University courses within the Laboratory building.

The staff includes:

R. D. STUART, M.B., Ch.B., M.D., D.Sc., D.P.H. (Aberdeen), F.R.C.P. (Glasgow); Provincial Bacteriologist and Director, Provincial Laboratory of Public Health.

D. SHUTE, M.B., Ch.B., M.D. (Manchester), D.T.M. (Liverpool); Director of Provincial Laboratory of Public Health (Calgary).

J. W. MACGREGOR, B.A., M.D. (Alberta); Provincial Pathologist.

F. L. JACKSON, M.R.C.S. (England), L.R.C.P. (London), M.B.B.S. (London), Dip.Bact. (London); M.C. Path., Consultant Bacteriologist.

J. W. CARMICHAEL, M.Sc. (Alberta), M.A., Ph.D. (Harvard); Specialist in Mycology.

G. O. BAIN, B.Sc., M.D. (Alberta); Assistant Pathologist.

ERIKA P. CRICHTON, M.B., Ch.B. (Glasgow); Bacteriologist and Associate Pathologist, Provincial Laboratory of Public Health, Southern Branch, Calgary.

T. K. SHNITKA, M.Sc., M.D. (Alberta); Assistant Pathologist.

SHEILA R. TOSHACH, B.Sc. (Alberta), M.A., Dip.Bact. (Toronto); Senior Assistant Bacteriologist.

ODOSCA MORGANTE, M.D. (Rome), M.Sc., Ph.D. (McGill); Virologist.

T. A. KASPER, B.Sc., M.D. (Alberta); Assistant Pathologist.

R. J. SWALLOW, B.A. (Saskatchewan), M.D. (Alberta); Assistant Pathologist.

ANNE M. BURSEWICZ, M.B., Ch.B. (Edinburgh), D.P.H. (Toronto); Assistant Bacteriologist.

BRUCE MIELKE, M.D. (Alberta); Assistant Pathologist.

YVONNE GOODMAN, M.Sc. (Alberta); Assistant Bacteriologist.

NORMAN SENN, B.Sc. (Alberta), Administrator, Provincial Laboratory of Public Health.

ST. JOHN'S COLLEGE

St. John's College in the City of Edmonton was affiliated with the University in 1963 under an agreement designed to train teachers who would be qualified to use for instructional purposes in the schools either the French or the English language. Its provisions include the offering by the College of certain courses which are accepted by the University as part of a three-year program leading to a professional teaching certificate or as part of a four-year progam leading to the degree of Bachelor of Education.

The following members of the staff of the College have been approved as instructors in these courses:

BOUSQUET, Jean Claude, Licence, D.E.S., C.A.P.E.S. (Paris) ..... Geography
DESMARAIS, Rev. D., A.B. (Ottawa), M.Sc. (Teaching) (St. Louis) ..... Physics
DROUIN, Rev. E., B.Ed. (Alberta), M.A. (Education) (Detroit), Ph.D. (Otaawa) ..... History
GODBOUT, Laurent, B.A., L.Ph. (Ottawa) ..... Philosophy
OWER, John B., B.A. (Honors) (Alberta), M.A. (Toronto) ..... English
POWRIE, Thomas L., B.S.A., M.A. (Saskatchewan), D.Phil, B.Phil (Oxford) .... Economics
SAUTIER, Marguerite, Licence, D.E.S., C.A.P.E.S., Agrégée (Lyons) ..... French
SOUCH, Stanley G., B.Ed., M.Ed. (Alberta) ..... Educational Psychology

THE UNIVERSITIES OF ALBERTA

INTER-UNIVERSITY ORGANIZATION

Short descriptions of the Universities Co-ordinating Council and of the Universities Commission follow. For an authoritative statement, the Universities Act, 1966, Statutes of Alberta, may be consulted.

THE UNIVERSITIES CO-ORDINATING COUNCIL

The Council is composed of the following representatives of each provincial university: the President; the Academic Vice-President; two deans and two other members of the academic staff appointed by the General Faculty Council; and not more than three other members of the academic staff appointed by the Co-ordinating Council. In even-numbered years, the Chairman is the President of the University of Alberta or his nominee; in odd-numbered years, he is the President of the University of Calgary or his nominee. The Council may appoint a secretary, and prescribe his powers, functions and duties.

The Council inquires into, and recommends to any general faculty council on, any matter that in its opinion requires or would be assisted by co-operative decisions or actions by the general faculty councils. Upon the request of a general faculty council, it may give advice and opinions to it on any matter. It may make to a general faculty council or a board such recommendations as it considers proper and desirable on matters relating to universities. It may determine minimum standards for the affiliation of colleges or institutions and may recommend affiliation, or the dissolution or modification of affiliation, of a college or institution with a university. It gives or withholds its approval of standards and policies proposed by a general faculty respecting the admission of first-year students to a university. Nothwithstanding anything contained in an Act which gives the Council jurisdiction in the matter of entry to a profession or calling, it may (a) make with the governing body of the profession or calling such arrangements for the carrying out of the Council's functions under the Act as the Council may consider desirable (b) require of candidates for entry the passing of examinations or the taking of courses of instruction (c) provide for setting and marking of examinations (d) waive examinations where it is satisfied that these are not required (e) establish a board of examiners and delegate to it such of the Council's powers as it may see fit and (f) authorize the board of examiners to appoint an executive committee from its own numbers and to make delegations to the committee.

The operating expenses of the Council are paid by the Universities Commission from moneys received by it from the Government of Alberta.

The current membership of the Council is:

University of Alberta—President Johns, Vice-President Wyman, Dean Smith, Dean McCalla, Dr. E. L. Empey, Dr. E. J. H. Greene, Dr. D. F. Cameron, Dr. J. W. Gilles.

University of Calgary—President Armstrong, Vice-President Trost, Dean Penelhum, Dean Hyne, Dean Neville, Dr. J. G. Nelson, Dr. J. G. Woodsworth, Dr. F. Terentiuk.

The current secretary is Associate Professor G. Samuel.

THE UNIVERSITIES COMMISSION

The Commission is composed of a Chairman appointed by the Lieutenant Governor in Council, the Deputy Minister of Education, the Deputy Provincial Treasurer, and six other persons appointed by the Lieutenant Governor in Council.

Its duties include inquiring into the financial needs of the Universities, advising the Government with regard to the granting of financial assistance for university purposes, and acting as an intermediary between the Government and the universities and between universities.

The Chairman is Dr. W. H. Swift, the ex-officio members Dr. T. C. Byrne and Mr. F. G. Stewart, and the appointed members Dr. C. M. Macleod, Mr. M. E. Wolfe, Dr. G. L. Burton, Dr. E. P. Scarlett, Mr. H. G. Thomson and Mr. L. A. Thorssen.

Mr. B. H. McDonald is Assistant to the Chairman.

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summer session '66

UNIVERSITY OF ALBERTA · EDMONTON



Important Information

TWO SUMMER SESSION CALENDARS AVAILABLE

Separate Calendars are available for the Summer Sessions being held in Edmonton and Calgary. This Calendar provides detailed information on only the Summer Session at Edmonton.

Students who propose to attend the Summer Session at Calgary should direct to the appropriate University officers there all correspondence, requests for information, registration forms, fees, and so forth.

SPECIAL INSTRUCTIONS TO STUDENTS FROM UNIVERSITY OF ALBERTA, CALGARY

1. Students from the University of Alberta, Calgary, who propose to take Summer Session courses at the University of Alberta, Edmonton, but have not previously attended there, must complete and file an Application for Admission not later than April 1st, 1966. This form may be obtained from the University Registrar at Edmonton.
2. All students from the University of Alberta, Calgary, who propose to register for courses in the Faculty of Education in the Summer Session at Edmonton, must file with their registration forms a statement (see page 69) from their Dean approving their choice of courses.

CHANGE IN FEE SCHEDULE

The registration fee of $2.00 formerly paid by undergraduate students has been eliminated. It has been replaced by a non-refundable deposit of $10.00 on tuition fees payable at the time of advance registration. In the case of students who attend the Summer Session, the deposit will be credited to their tuition fee account. Students who do not attend after completing an advance registration will forfeit the deposit.

CHANGE IN COURSE LOAD REGULATIONS

Effective July 1, 1967, the following regulation will apply to students' course loads in the Summer Session:

One full-year course, or the equivalent, is regarded as the normal load for Summer Session students. However, students with good academic records may be permitted by their Faculties to register to a maximum of two full-year courses or the equivalent.

SUMMER SESSION STUDENTS' UNION PRIZES

Four cash prizes of $100 each are now available annually to Summer Session students. For details, see page 17 of this Calendar.

A directory of important University administrative offices will be found in the inside of the back cover of this Calendar.

Cover: Chemistry Building and Courtyard.

UNIVERSITY OF ALBERTA

Forty-eighth

SUMMER SESSION

1966

Edmonton, Alberta

COMMUNICATIONS

Mail should be addressed to the appropriate officer at the University of Alberta, Edmonton, Alberta.

Dr. W. H. Johns, *President*

Dr. J. W. Gilles, *Director, Summer Session*

Dr. D. E. Smith, *Dean, Faculty of Arts*

Dr. D. M. Ross, *Dean, Faculty of Science*

Dr. H. T. Coutts, *Dean, Faculty of Education*

Dr. A. G. McCalla, *Dean, Faculty of Graduate Studies*

Dr. H. W. Harries, *Dean, Faculty of Commerce*

Dr. M. L. Van Vliet, *Dean, Faculty of Physical Education*

Dr. Elizabeth Empey, *Director, School of Household Economics*

Mr. A. D. Cairns, *Registrar*
Admissions, Registration, Examinations, Records, Transcripts, Convocation.

Mr. A. J. B. Hough, *Director, Student Counselling*
Change of Faculty, Interest and Aptitude Tests, Personal Problems, Unsatisfactory Standing, Vocational Planning, Withdrawals from University.

Mr. J. M. Whidden, *Bursar*
Payment of Fees

Mr. J. Stoneham, *Director, Housing and Food Services*
Residence Accommodation, Off-campus Housing

OFFICE HOURS

Monday through Friday
8:30 a.m. to 12:00 noon and 1:00 p.m. to 4:30 p.m.

Saturday
Offices closed.

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Office Directory ..... *Inside Back Cover*

ACADEMIC SCHEDULE

Summer Session, 1966

March—

Thursday, 31—

Last day for receiving Summer Session registrations with entitlement to discount on tuition fees.

April—

Friday, 1—

Last day for receiving applications for admission from new students, undergraduate or graduate, who wish to enter the University at Edmonton in the 1966 Summer Session.

N.B. The above requirement applies also to U.A.C. students planning to attend Summer Session at the Edmonton Campus.

May—

Monday, 2—

Last day for receiving Summer Session registrations.

June—

Monday, 6—

Last day for the payment of Summer Session fees without penalty.

July—

Monday, 4—

8:00 a.m.—Lectures begin.

9:00 a.m.-11:00 a.m.
12:00 noon-2:00 p.m.
} Confirmation of registration: Education Building, Arts Building and Lecture Wing of Mathematics-Physics and Chemistry Buildings.

Monday, 11—

Last day for payment of Summer Session fees.

Friday, 15—

Last day for application for Graduate degrees and degrees in Arts, Business Administration and Commerce, Education, Pharmacy, and Science to be conferred at Fall Convocation.

August—

Monday, 15

Final examinations commence.

GENERAL SECTION

The University of Alberta Summer Session at Edmonton offers a wide selection of courses for the convenience of students who are unable to attend the regular sessions. Special attention is given to meeting the needs of teachers desirous of improving their professional qualifications.

An important feature of the Summer Session is the requirement that a substantial portion of course content must be mastered before the session opens. The reason for this requirement is that summer courses carry the same credit as regular session courses, even though the summer term is of only six weeks' duration.

Students should register as early as possible. The deadline for registration is May 2.

The University reserves the right to limit registration in, or to withdraw, any of the courses proposed for the 1966 Summer Session.

CLASSIFICATION OF STUDENTS

In the Summer Session students are classified as graduates, undergraduates, special, and auditors.

Graduate Students are admitted to the Faculty of Graduate Studies in one of the following categories:

1. **Candidate for a master's degree.**
2. **Provisional candidate for a doctor's degree.** All Ph.D., and Ed.D. candidates are classified as provisional candidates until they have passed their Candidacy Examinations.
3. **Probationary graduate student.** One whose university record is either: (a) difficult to assess (e.g., some foreign students) or (b) below the standard normally required.
4. **Conditional graduate student.** One who is required to take undergraduate courses prerequisitie to, and in addition to, the graduate program. Fees for such courses are not included in graduate program fees.
5. **Special graduate student.** One who wishes to take graduate courses for purposes other than degree credit at this university.

Undergraduate Students are those who possess full senior matriculation and who are taking one or more courses for credit towards an undergraduate degree.

Special Students are those who, although registered in one or more courses, are currently neither seeking credit towards a degree or diploma granted by this university, nor entrance into a graduate program.

Auditors are students who have been granted official permission to attend lectures in a course on the understanding that they may not participate in class discussion, assignments or examinations. The audit privilege is restricted to students who are currently registered in a degree or diploma program and who secure written permission from the instructor in the course, endorsed by the students' Dean or Director, to register in the course as an auditor.

Students should not seek permission to audit courses until after the commencement of lectures.

MATRICULATION REQUIREMENTS

General requirements

Matriculants from the high schools of Alberta seeking admission to the University must possess—

(a) a high school graduation diploma with

(b) "B" (50%) or higher standing in the required courses of Grade XII as set forth in the prescriptions of the various faculties and schools, and

(c) an average in these courses of at least 60.0%.

Notes:

1. A student from another Province in Canada who has obtained clear senior matriculation for the University or Universities of that Province will be admitted to the University of Alberta with clear matriculation subject to the requirements for the first year courses in each program. Students who do not have clear matriculation on this basis will be required to complete full Alberta matriculation of the Faculty to which admission is sought.
2. The requirement of a high school diploma may be waived for adult students.
3. These general regulations notwithstanding, the University may, at its discretion, refuse admission to any applicant. For example, this right may be exercised in cases where applicants have written an inordinate number of examinations in order to obtain nominal entrance requirements.

Faculty of Arts

For B.A., B.Mus., and B.F.A. Programs—The general requirements with credit in:

1. English 30;
2. Social Studies 30;
3. Mathematics 30;
4. A language other than English (see below);
5. Physics 30 or Chemistry 30 or Biology 30 (or 32 if credit obtained before September, 1965);
6. A second language (item 4) or a second science (item 5).

Notes:

1. The matriculation language other than English normally will be one of the languages taught in Alberta High Schools, i.e. French 30, Latin 30, or German 30. However, the Faculty will accept Greek, Italian, Russian or Spanish at an equivalent level.
2. If a second matriculation language is presented, it may be any of the languages mentioned in the preceding paragraph, or any other langauge (at an equivalent level) provided it is not from the same linguistic group as the first matriculation language. Students wishing to present a language not mentioned above should submit to the Dean's office evidence of their attainment in that language.
3. Candidates for the Bachelor of Music must present Grade VIII practical and Grade IV and V theoretical of the Western Board of Music.

Faculty of Science

For a B.Sc. Program—The general requirements with credit in:

1. English 30;
2. Social Studies 30;
3. Mathematics 30;
4. **One** of: French 30, German 30, Latin 30, or another language of an equivalent level;
5. and 6. **Two** of: Chemistry 30, Physics 30, Biology 30 or 32.*

Note: Mathematics 31 (Trigonometry) with B standing or better will also be required for admission to the honors programs in Mathematics, Physics, and Physics and Geology. It is strongly recommended also for students intending to concentrate on studies in the Physical Sciences (Chemistry, Geology, Mathematics and Physics) in the general program.

Faculty of Business Administration and Commerce

For a B.Com. Program—The general requirements with credit in:

1. English 30;
2. Social Studies 30;
3. Mathematics 30;
4, 5, and 6. **Three** of Chemistry 30, Physics 30, Biology 30 or 32,* French 30 or German 30 or Latin 30 or another language at an equivalent level, or Mathematics 31.

Faculty of Education

For a B.Ed. Program—The general requirements with credit in:

1. English 30;
2. Social Studies 30;
3, 4, 5, 6. **Four** of: French 30, German 30, Latin 30, Chemistry 30, Physics 30, Biology 30 or 32,* Mathematics 30, Mathematics 31, Music 30.

Notes:

1. Candidates intending to major in biological sciences or household economics should present Chemistry 30 or equivalent.
2. Candidates intending to major in physical sciences should present Chemistry 30, Physics 30, and Mathematics 30 or equivalents.
3. Candidates intending to major in mathematics should present Mathematics 31 in addition to Mathematics 30.
4. Mathematics 31 will be accepted only on the basis of a Grade XII Departmental examination.

---

*Credit in Biology 32 will be accepted provided it was obtained prior to September 1, 1965.

Other Faculties

Students interested in the matriculation requirements of other faculties and schools of the University should address a request for the appropriate calendar to the Registrar.

MATRICULATION DEFICIENCIES

Students wishing to remove matriculation deficiencies are advised that instruction in Grade XII courses will be provided in the summer of 1966 by the following: Alberta College, Edmonton; Edmonton Public School Board; Mount Royal College, Calgary; Lethbridge Junior College.

Special arrangements for clearing matriculation deficiencies are also available in the Faculty of Education for teachers who were granted Alberta Second-Class Certificates prior to 1935. Teachers wishing to take advantage of these arrangements should communicate directly with the Dean of Education at Edmonton.

ADMISSION PROCEDURES

Application Forms

Prospective Summer Session students who have not previously attended the University of Alberta at Edmonton must secure and complete Application for Admission forms and must submit them to the appropriate office by April 1.*

Applicants for admission to undergraduate programs or as special students may obtain forms from the Registrar of the University at Edmonton. Application forms for admission to the Faculty of Graduate Studies may be obtained only from the office of the Dean of that Faculty.

Transcripts

Every applicant should arrange, **prior to the deadline,** for the Registrar of the University (or the Dean of Graduate Studies if he is applying for entrance to that Faculty) to receive an **official transcript** of his high school education and one transcript (two transcripts for Graduate Studies) of any courses taken at another university or college, **to be sent directly from the Department of Education or other institution maintaining such records.**

Advanced Standing

Students from other universities may be admitted to advanced standing except in the combined courses. Extramural credits from recognized universities may be accepted under certain conditions, but such credits will not be considered beyond the first year of university work. Students who have taken the equivalent of university courses in some other manner may be excused such courses but will not be granted advanced standing in them. They will be required to substitute other courses in order to complete a program of normal weight at this university.

All applications for such admission should be addressed to the Registrar well in advance of the beginning of the session. Each application will be

*This prescription applies even in the case of students who have been admitted to the University of Alberta, Calgary.

dealt with on its merits. The University reserves the right to require applicants for advanced standing to write examinations at any level including that of matriculation.

The amount of advanced standing that may be granted is limited by the residence requirements of the University of Alberta.

Visé Fees

A fee of $5.00 is charged for the evaluation of educational documents issued in Canada but outside Alberta; the fee is $10.00 for documents issued in other countries. Students entering the Faculty of Graduate Studies are exempt from visé fees.

REGISTRATION PROCEDURES

A student is responsible for the completeness and accuracy of his registration. He is also responsible for any adjustments of registration made necessary by the results of supplemental examinations. Particular care should be exercised with regard to prerequisite courses. Registration in courses which directly conflict on the time table will be allowed only when the permission of the Faculty Council concerned has been secured.

Limitations on Registration

1. Normally a student will be permitted to register for two full-year courses or the equivalent in the Summer Session if his previous record of achievement is satisfactory.
2. There are, however, certain designated laboratory courses which may not be taken concurrently with other courses. This limitation, when it applies, is indicated immediately after the course description.
3. Under no circumstances will a student be permitted to register in more than the equivalent of two full-year courses in the Summer Session, or of one full-year course if he attends only one term of the session.
4. No student may offer for credit in any period of twelve consecutive months more than three full-year courses taken by a combination of Summer Session, Evening Credit Program or late afternoon classes, and extramural study.
5. In the Faculties of Arts and Science no student, except by special permission of the Council of the Faculty, may offer for credit in any period of twelve consecutive months commencing September 1, more than five full-year courses.

Course Selection

Since there will be only three lecture periods per day, many classes will be in session at the same time. Students are urged to look carefully at the timetables displayed towards the end of this Calendar before selecting their courses.

Students are also advised to give priority to the compulsory courses and the laboratory courses in their program. By so doing, they will minimize registration difficulties that may arise at a later date because of timetable conflicts.

Advance Registration

Registration forms must be completed and returned in duplicate to the Registrar at Edmonton not later than May 2. These forms must be accompanied by a non-refundable registration fee of $10.00 in the case of graduate students, or by a non-refundable deposit on tuition fees of $10.00 in the case of undergraduates.

Students, except those registered in the Faculty of Graduate Studies, whose registration forms are received, or postmarked, not later than March 31, will be granted a reduction in instruction fees of $5.00 per full-year course.

Students whose registrations have been approved will receive from the Registrar a statement of fees and later (in June), class admission cards.

Confirmation of Registration

On the first day of lectures, Monday, July 4, all students must confirm their advance registration by reporting their presence to registration clerks **anytime** from 9:00 a.m. to 11:00 a.m. and from 12:00 noon to 2:00 p.m. at the main entrances of **any one** of the following buildings: Arts Building, Education Building, and Lecture Wing V of the Mathematics-Physics and Chemistry Buildings. Special forms for this purpose will be mailed to students in June with their Class Admission Cards.

Students attempting to confirm their registration after the appointed time may be refused permission. If permission is granted, a late penalty fee of $3.00 plus $2.00 per day will be assessed.

Change or Cancellation of Registration

After confirming his registration, a student may not change from one course to another, abandon a course, or withdraw from the Summer Session without first obtaining permission from the Dean or Director of his faculty or school. This permission, in the form of a "Change of Registration" or "Withdrawal" slip, signed by the Dean or Director, must be presented to the Registrar before the change becomes official.

A student who abandons a course or withdraws from the Summer Session without completing the required forms will not be eligible for any refund of fees, nor for exemption from fees in the event that he had not paid them.

Payment of Fees

Upon payment of fees students will receive an identification card. Registration is incomplete until fees have been paid and is subject to cancellation unless payment has been made by the final date mentioned in the following regulations.

1. Fees should be remitted by cheque or money order payable at par to the University of Alberta—not to any officer of the University.
2. Fees are payable at the time of advance registration. If, for any reason, payment is deferred until after receipt of a fee assessment, fees together with the fee assessment card should be sent direct to the Bursar, University of Alberta, Edmonton.
3. The last date for the payment of fees by undergraduates students is June 6. A penalty fee of $5.00 will be charged on any payment made or postmarked subsequent to that date and must be added to any remittance mailed or

delivered to the University. If payment in full has not been made by July 11, registration will be subject to cancellation, and the student to exclusion from classes. There is no provision for partial payments.

4. The last date for the payment of fees by graduate students is June 6 or fifteen days after the date of assessment, whichever is the later. A penalty of $5.00 will be charged on any payments made or postmarked subsequent to that date.
5. In case of non-attendance all fees paid, except the registration fee or the $10.00 deposit on tuition fees, will be refunded upon application to the Registrar.
6. If notice of cancellation of registration is received by the Registrar by July 11, all fees except the $10.00 graduate registration fee or $10.00 undergraduate deposit will be refunded. If notice is received subsequent to July 11, a *pro rata* charge from July 4 will be made and the balance refunded except that no refunds will be made where withdrawal or cancellation is subsequent to August 5.

FEE SCHEDULE

NOTE—These fees are subject to change without notice

Undergraduate Programs

General Fees

Students' Union: General	$ 2.00
Building	2.50
	$ 3.50
Yearbook Fee (optional at registration)	$ 6.00

Instruction Fees

Per full-session course	*$100.00
Per half-session course	** 50.00
Auditor's fee, per full-session course	12.00

Graduate Programs

General Fees

Registration	$ 10.00
Students' Union: General	1.00
Building Fund	2.50
	$ 13.50
Yearbook Fee (optional at registration)	$ 6.00

Instruction Fees

Students registered for the M.Ed. degree and who obtain residence credit at Summer Session (Applicable only to students on program before September, 1962 and to graduate students in Industrial and Vocational Education)	$195.00

*$95.00 if advance registration is completed by March 31.

**$47.50 if advance registration is completed by March 31.

All graduate students who have paid the basic M.Ed. degree program fee in full (three registrations), for each additional registration in a Summer Session ..... $ 40.00

All other graduate students (per full-session course) $100.00

Students who register for Summer Session will, without registering for the winter session, be entitled to: (a) receive thesis direction from the division or department and use the library for twelve months, and (b) graduate at Fall or Spring Convocation.

PRESESSION STUDY

In view of the brevity of the Summer Session, it is expected that students will have mastered a substantial portion of the content of their courses prior to the opening of the session.

Study Outlines

Study outlines giving directions for preparatory work in each course will be sent to students as soon as, but not before, their registrations have been approved.

Textbooks

Titles of textbooks will be included in the study outlines. Students who will be attending the Summer Session at Edmonton should obtain their textbooks from the University Bookstore at Edmonton. (Textbooks carried by the University Bookstore at Calgary may not be identical with those required in courses offered at Edmonton.) Mail orders will be accepted only an a C.O.D. basis.

Students are advised to order textbooks required for pre-session study immediately after receiving outlines. Failure to do so may result in their being unable to obtain prompt delivery at a later date due to books being temporarily out of stock.

Preliminary Examinations

Examinations on the prescribed preparatory study will be held during the first week of classes. If preparation proves to be inadequate, a student may be asked to withdraw from the course. This requirement makes it all the more necessary that registration be completed at an early date, textbooks secured, study commenced, and work carried forward consistently.

ATTENDANCE

1. Regular attendance is expected of students in all courses. Students having an inordinate number of unexcused absences from a course may be refused permission to take the final examination.
2. Absences are counted from the first day of the session.
3. Students who are late for a lecture or laboratory period will be marked absent unless at the end of the period in question they account satisfactorily to the instructor for their lateness.

4. Illness and Physical Disability:
   (a) Students who are absent from two or more consecutive classes in a course because of illness or disability should report the reason to the instructor upon their return.
   (b) Absence from term or final examinations. See paragraphs 5 and 6 of the next section (Examinations).

5. Students who are absent from two or more consecutive classes in a course for some valid reason other than illness should report to the instructor upon their return. If the instructor requires an absence slip, it will be the student's responsibility to have one signed by the Registrar, and show it to the instructor.

6. Students desiring leave of absence in a given course must apply to the Registrar. At the end of such period of absence, the student must present an absence slip for the Registrar's signature.

EXAMINATIONS

1. **Final Examinations.** Final examinations will commence on Monday, August 15.

2. **Distribution of Credits.** In each course where a final examination is held credit of not less than 30% and not more than 70% will be assigned to term work. The remaining credit in each course will be assigned to the final examination.

3. **Pass Marks.** For students proceeding towards an undergraduate degree the pass mark is 50% unless otherwise specified; in courses taken toward a graduate degree the pass mark is 65%.

4. **Debarment from Final Examination.** A student may be refused permission to write a final examination in a course on the recommendation of the department concerned and with the concurrence of the Dean of his faculty in the following circumstances:
   (a) The student has an inordinate number of unexcused absences.
   (b) The student has neglected to do a substantial proportion of his written assignments in a course of which they are an essential feature.
   (c) The student has neglected to do a substantial proportion of the laboratory work in a science course.

5. **Absence from Term Examinations or Tests.** If a student has an unexcused absence from a term examination or test, the mark assigned to him will be zero. However, in case of illness the student may be excused from writing the examination or test. In applying for exemption a student must present to his instructor an absence slip signed by a physician. When exemption is granted the percentage allotted to the examination or test missed will be added to the percentage allotted to the final examination.

6. **Absence from Final Examinations.** Any student who is ill or suffering from severe domestic affliction is advised not to sit for a final examination. Instead he should advise the Registrar at once of the circumstances and

should apply for a deferred final examination to be written at the time of the Winter Session finals the following April. Similar action should be taken by a student who, because of religious convictions or for other cogent reasons, is unable to write a final examination at the scheduled time. Such application will be referred to the student's Dean or Director for a final decision.

If a student becomes ill or receives word of domestic affliction during the course of an examination, he should report at once to the Supervisor, hand in his unfinished paper and request that it be cancelled. Thereafter, if illness is the cause, he must go directly to the Infirmary so that any subsequent application for a deferred examination may be supported by a medical certificate. The Registrar should be notified of the circumstances in writing within forty-eight hours of the examination.

Should a student write an examination, hand in his paper for marking, and later report extenuating circumstances to support his request for cancellation of his paper and for another examination, such request will not be entertained.

7. **Statement of Record.** After the Summer Session a statement of record will be mailed to each student at the home address indicated on his registration form.

8. **Re-appraisal of Final Examination Papers.** Since great care is taken in the marking of final examination papers, a student should apply for re-appraisal of a paper only if he has good reason to believe that a mistake has been made. Re-appraisals are dealt with by the head of the department in consultation with members of the staff. A request for re-appraisal must be made by letter to the Registrar within thirty days after the publication of results, accompanied by a fee of $10.00 for each paper. The fee will be refunded if the mark is raised from a failure to a pass, or from Class III to Class II or from Class II to Class I or by at least 5% within a passing grade.

10. **Deferred Final Examinations.** A student who has missed a final examination because of illness or domestic affliction or who is obliged to absent himself from an examination for some other compelling reason (including religious convictions) may apply for a deferred final examination to be written at the time of the Winter Session finals the following April.

11. **Examination Fees.**

    (a) **Final Examinations:** No fee is levied for final examinations written during the regular examination periods.

    (b) **Deferred Final Examinations:** A fee of $5.00 is charged for each deferred final written during regular supplemental examination periods. The fee for special deferred finals requiring the setting of special papers is $10.00 per paper.

    (c) **Outside Centers:** An additional fee of $5.00 per subject is charged for writing deferred final examinations in established Alberta centers other than Edmonton.

LIVING ACCOMMODATION

Residences

Approximately 1,200 students can be accommodated in University residence halls during the summer session. Only persons registered at the University of Alberta or persons affiliated with the University may live in residence. Application forms may be obtained by writing directly to the Housing Office, Lister Hall. An advance payment of thirty dollars ($30.00) must be included with the completed application forms. Reservations will not be held beyond the night of July 4th unless special arrangements have been made with the Housing Office. Twenty dollars of the advance payment will be refunded should cancellation occur prior to June 20th. No refund will be granted after that date.

The room and board charge for the entire summer session is $150.00 per person in a single room and $140.00 per person in a double room. These amounts, less the $30.00 advance payment, are due on July 4th of 1965.

A limited amount of accommodation is available in St. Stephen's College and St. Joseph's College. Details can be secured by writing to the Colleges directly.

Jurisdiction over the conduct of the students in the University residences during the summer session is vested in the Provost, Resident Deans and the Men's and Women's House Committees, authorized by the Deans' Council for this purpose.

Off-Campus Housing Service

As an aid to students and landlords, the Housing Office in Lister Hall maintains a listing service for off-campus accommodations. Because listings change daily, it is not practical to mail this list to prospective students. The listing service may be checked in person at the Housing Office until 11:00 p.m. each evening.

Food Services

Lister Hall provides a full-meal cafeteria at set prices for meals as well as a snack bar which offers snacks and meals on an à la carte basis. Also, the Students' Union Snack Bar will be open for à carte service during the summer session.

STUDENT COUNSELLING SERVICES

The University provides a counselling service available throughout the year to all University students and prospective students.

1. **Prospective Students.** A bulletin, "Information for Prospective University Student", has been prepared to answer the questions commonly asked. Interviews can be arranged at any time prior to the opening of the Summer Session.

2. **Counselling Services.** Students may make use of the service in regard to studies, vocational choice, personal and financial problems.

3. **Change of Faculty.** Students contemplating a change of school or faculty are advised to consult a counsellor. This should be done well before the opening of the session.

4. **Withdrawal from the University.** Any student who for any reason is contemplating withdrawal from the University should arrange an interview with a counsellor and subsequently with his Dean or Director.

STUDENT HEALTH SERVICES

A Student Health Service Fund is maintained by an annual appropriation from fee revenue. This fund provides for treatment of minor ailments only and cannot be expected to take care of prolonged or otherwise costly illness.

Students are urged to be in possession of the telephone number of the Infirmary (439-4991) and of the consulting hours of the Infirmary Physician. In cases of illness or emergency the nurse in charge should be called without delay.

TEACHER PLACEMENT SERVICE

The National Employment Service, which maintains an office in the University Administration Building, is prepared to assist teachers who are seeking employment with school boards. The service has listings of teacher requirements from school boards throughout the whole Province. Summer Session students are urged to register with N.E.S. on arrival so that interviewing schedules may be set up with visiting boards.

RECREATIONAL ACTIVITIES

Students are urged to remember that the recreational program of the Summer Session is rich in opportunities for the enjoyment of sports as well as social, cultural and educational activities.

Students who are interested should bring appropriate clothing and equipment for participation in fastball, bowling, tennis, badminton, golf, archery, swimming, hiking and possibly skating.

Social and cultural activities include both informal and semi-formal dances, sing-songs, hymn-sings, afternoon teas, musical recitals, and dramatics.

The educational program consists mainly of lectures delivered by speakers chosen for their competence in the fields in which they speak.

AWARDS

Summer Session Students' Union Prizes

Four prizes of $100 each will be offered annually to students graduating from the University of Alberta, Edmonton, with a Bachelor's degree for which the final requirements were completed by Summer Session. The awards will be made to those with the highest averages on the last five full-year courses (or equivalent) taken in Summer Sessions at the University of Alberta and counted towards the degree, provided that the averages are not less than 75%.

FALL CONVOCATION, 1966

Summer Session students who expect to qualify for a degree to be conferred at the Fall Convocation, 1966, should note carefully that announcements regarding the Convocation will be sent to their homes or permanent addresses as reported on their Application for Degree forms. It is the responsibility of these students to advise the Registrar of changes in their addresses.

THE FACULTY OF ARTS

The Faculty of Arts offers honors programs and a general program leading to the degree of Bachelor of Arts (B.A.), and also programs in the Fine Arts leading to the degrees of Bachelor of Fine Arts (B.F.A.) and Bachelor of Music (B.Mus.). It also offers courses in association with other faculties leading to a variety of professional degrees. For further details students should consult the Arts Calendar, which may be obtained from the Registrar.

Honors programs are not available in the Summer Session.

THE GENERAL PROGRAM

Students who are planning to begin work in the Faculty of Arts in the 1966 Summer Session should contact the office of the Dean before registering.

Course Requirements for the B.A.

First Year

English 200; an Arts course; a laboratory Science course; two options; Physical Education.

Second Year

An Arts course; a Natural Science course; three options.

Third Year

An Arts course; a Natural Science course; three options.

Notes:

1. Each student must include in his program a minimum of three courses and a maximum of five in a principal subject of concentration, and a minimum of three and a maximum of four in a second subject of concentration.
2. There may not be more than seven junior courses in the program, except by special permission of the Dean.
3. A student registering for the B.A. degree must choose his principal subject of concentration in the humanities or in the social sciences.*
4. To be awarded the B.A., the student must present credit in at least eight courses in the humanities and social sciences.

Graduation Requirement

To be granted the B.A. degree, a student must present passing marks or better in a minimum of fifteen full-year courses or their equivalent, and an average of at least 60 per cent on all courses credited towards the degree after the first year.

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*Either the B.A. or B.Sc. degree may be taken with Mathematics as the principal subject of concentration. Students wishing the B.A. degree should consult the Department of Mathematics concerning a suitable sequence of courses.

B.A. AFTER B.ED.

Holders of the B.Ed. degree, whose programs include thirteen Arts and Science courses, may qualify for the B.A. degree by completing a six-course program as prescribed by the Faculty of Arts. Those with fewer than thirteen Arts and Science courses will be required to take additional courses.

Students who propose to secure the B.A. degree in this manner are advised to consult the Dean before registering in the Faculty of Arts.

B.A. AFTER B.SC.

Students who have qualified for the degree of B.Sc. may proceed to the degree of B.A. by completing a nine-course program as prescibed by the Faculty of Arts and attaining an average of 60% in these courses.

THE FACULTY OF SCIENCE

The Faculty of Science offers honors programs and general programs leading to the degrees of Bachelor of Science (B.Sc.), and Bachelor of Science in Household Economics. It also offers courses in association with other faculties leading to a variety of professional degrees. For further details students should consult the Science Calendar which may be obtained from the Registrar.

Honors programs are not available in the Summer Session.

THE GENERAL PROGRAM

Students who are planning to begin work in the Faculty of Science in the 1966 Summer Session should consult the Dean of the Faculty.

Course Requirements for the B.Sc.

First Year

English 200 or 210; an Arts course; a Science course; two options; Physical Education.

Second Year

An Arts course; a Science course; three options.

Third Year

An Arts course; a Science course; three options.

Notes:

1. Each student must include in his program a minimum of three courses and a maximum of five in a principal subject of concentration, and a minimum of three and a maximum of four in a second subject of concentration.
2. There may not be more than seven junior courses in the program, except by special permission of the Dean.
3. A student registering for the B.Sc. degree must choose his principal subject of concentration in the physical or biological sciences. To be awarded the B.Sc., the student must pass at least eight science courses. Not more than eleven science courses may be credited towards the degree.

Graduation Requirements

To be granted the B.Sc. degree, a student must present passing marks or better in a minimum of fifteen full courses, and an average of at least 60 per cent in all courses credited toward the degree after the first year.

B.SC. AFTER B.ED.

Holders of the B.Ed. degree, whose programs include thirteen Arts and Science courses, may qualify for the B.Sc. degree by completing a six-course program as prescribed by the Faculty of Science. Those with fewer than thirteen Arts and Science courses will be required to take additional courses.

Students who propose to secure the B.Sc. degree in this manner are advised to consult the Dean before registering in the Faculty of Science.

B.SC. AFTER B.A.

Students who have qualified for the degree of B.A. may proceed to the degree of B.Sc. by completing a nine-course program as prescribed by the Faculty of Science and attaining an average of 60% in these courses. Students with incomplete matriculation for the Faculty of Science will be required to remove any deficiency.

THE FACULTY OF EDUCATION

The Faculty of Education is organized for the professional education of teachers for elementary and secondary schools and for graduate study and research in the field of Education.

GENERAL INFORMATION

Summer Session Programs

In the Summer Session, the Faculty of Education in association with the Faculties of Arts and of Science offers courses appropriate to the following programs:

1. B.Ed. Program—Elementary Route
2. B.Ed. Program—Secondary Route
3. B.Ed. Program in Industrial Arts
4. B.Ed. Program in Vocational Education
5. B.Ed. Program for Holders of Approved Degrees
6. Advanced Study in Education

These programs are described in detail in the sections that follow.

Advanced Standing for Certificated Teachers

Certificated teachers who have had a year of teacher education and who have clear matriculation into the Faculty of Education will be given a year of advanced standing on the four-year B.Ed. program.

The granting of advanced standing for courses taken in Alberta Department of Education summer sessions was discontinued June 1, 1965.

Basic Graduation Requirements (Applicable to Summer Session students registered on programs 1-4 above)

1. To be granted the B.Ed. degree, a student must obtain a passing mark or better in each course and obtain an average of 60% on all courses credited toward the degree. (Those who transfer to the B.Ed. program, University of Alberta, with advanced standing will be required to maintain a 60% average on all courses completed at the University of Alberta toward the B.Ed. degree.)
2. The privilege of repeating a failed course will not be granted more than once.
3. The maximum number of additional courses, including repeated courses, in which a student may enrol for the completion of a B.Ed. degree program may not exceed by more than five the number of courses required for completion of the particular B.Ed. degree program.

Students admitted prior to January 2, 1963, will be allowed to graduate, provided they do so before June 30, 1966, by taking advantage of these graduation requirements or of those set forth in item 1, page 50 of the 1962-63 Calendar of the Faculty of Education.

Certification of Out-of-Province Teachers

Teachers holding certificates not issued by the Province of Alberta should apply directly to the Registrar, Department of Education, Administration Building, Edmonton, for an equivalent Alberta teaching certificate.

One requirement for making such certificates permanent in Alberta may be the successful completion of two courses at a University of Alberta Summer Session. The Registrar, Department of Education, will decide whether this is required. When such courses are prescribed they should be chosen in consultation with the Faculty of Education.

It is important that candidates who wish these courses to count for degree credit as well as for certification consult with the Faculty to make sure that they apply on a degree program. Candidates with the B.A. or similar degree may wish to begin the B.Ed. program for holders of approved degrees as mentioned above. Those with the B.Ed. degree who may wish to be considered for the M.Ed. program should elect education courses numbered over 500.

THE STANDARD ELEMENTARY B.ED. PROGRAM

Upon completion of the first two years, candidates are eligible for the Interim Standard E Certificate, valid in Grades I to IX; completion of three years earns the Interim Professional Certificate, valid in Grade I to XII; completion of four years, the B.Ed. degree.

Degree Program for Certificated Teachers

First Year

Credit granted on the basis of at least seven months of teacher education.

Second Year

1. English 200 or 210
2. Major
3. Major
4. Arts or Science option
5. Arts or Science option
5. Senior Education option

Third Year

1. Educational Psychology 476
2. Philosophy 240 or 242.
3. Major
4. Approved Arts option in social science or history
5. Approved Arts or Science or Education option

Fourth Year

1. Educational Foundations 492
2. Major
3. Arts or Science option
4. Senior Education option
5. Senior Arts or Science option.

Notes on the Program:

1. The following courses, which are being offered in the 1966 Summer Session, may be presented as approved options under item 4 of the program for the third year:

Anthropology 202, Economics 200, History 200 and 370, Geography 201, Political Science 200, Sociology 202.

2. Graduation Requirements:
   (a) The basic requirements listed above.
   (b) Students must also include in their programs an approved Arts or Science option from each of two fields, chosen from the following six: art, drama, mathematics, music, physical education, and science.

   The following courses, which are being offered in the 1966 Summer Session, may be presented in fulfilment of requirement 2(b):

   Art 200, 230, 240; Biology 130, 230; Drama 240; Mathematics 264, 274; Music 210; Physical Education 202; Zoology 300.

Elementary Route Major Fields

Candidates must select a major field of study. Courses are to be chosen according to the patterns listed below:

I. Art

1. } Two of: Art 230, 240, 250
2. }
3. Senior Art course sequent to one taken previously
4. Ed. CI 410

II. English

*1. } Two of: English 288, English 398, Linguistics 389
*2. }
3. Senior English or Linguistics 389.
4. Ed. CI 420 or 422 or 438

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*All students must take English 288 or Linguistics 389, **and** English 398.

III. Early Childhood Education

1. } Three of: Art 200 or 230; Drama 240 or 250; English 398; Music 200
2. } or 210; Physical Education 202
3. }
4. Ed. CI 420 or 426

IV. French

1. French 201
2. French 330
3. Approved senior French
4. Ed. CI 436

V. Mathematics

1. Mathematics 274
2. Mathematics 374
3. Mathematics 242
4. Ed. CI 428

VI. Music

1. Music 200
2. Music 300
3. Music 250 or 400
4. Ed. CI 414

VII. Physical Education

1. Physical Education 202
2. Physical Education 325 and 327
3. Physical Education 419 and 421
4. Physical Education 431 and one of P.E. 427 or 433

VIII. Science

1. }
2. } Three laboratory science courses in at least two different fields.
3. }
4. Ed. CI 432

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*Students selecting a biological science in the first year must select a physical science in the second year, and vice versa.

IX. Social Studies

*1. A basic (200 level) course in any social science including history
*2. }
*3. } Two senior courses in the social science elected in item 1
4. Ed. CI 406

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*The three courses of the major must be in a field *other* than that selected as a social science or history option in the third year.

Use of Options

Students should give careful consideration to the various opportunities provided by the Arts or Science option, the Education option, and the Senior Arts or Science or Education option in the Elementary Route program. These may be regarded as "free" options and used to explore a variety of fields; or they may be patterned in such a way as to provide some preparation for certain functions related to teaching in the elementary school.

The following are illustrative of the ways in which these courses may be patterned:

1. *Elementary School Libraries*
   Ed. CI 346
   Ed. CI 446
   English 398 or an approved Arts option
2. *Education of exceptional children in the elementary school*
   (a) Ed. Psy. 354
   (b) One of: Ed. Psy. 450, 452, 454, 456, or 458
   (c) One of: Genetics 351; Physiology 360; Sociology 320, 370
   or
   Two of: Psychology 336, 341, 353, 365, 366, 383, 431, 475, 489
3. *Further study in the major field*
   Two Arts or Science courses in major field
   One supporting Education option

THE STANDARD SECONDARY B.ED. PROGRAM

Upon completion of the first two years, candidates are eligible for the Interim Standard S Certificate, valid in Grade IV to XI; completion of three

years earns the Interim Professional Certificate, valid in Grades I to XII; completion of four years, the B.Ed. degree.

Degree Program for Certificated Teachers

First Year

Credit granted on the basis of at least seven months of teacher education.

Second Year

1. Major
2. Major
3. Curriculum and Instruction (major field)
4. English 200 or 210
5. Approved Arts option in social science or history
6. Major
7. Major or Arts or Science option

Third Year

1. Educational Psychology 476
2. Philosophy 240 or 242
3. Major
4. Major or Arts or Science option
5. Senior Education option

Fourth Year

1. Educational Foundations 492
2. Major
3. Senior Education option
4. Major or Arts or Science option
5. Major or Arts or Science option

Notes on the Program:

1. At least three courses in the major field must be completed by the end of the second year.
2. Graduation requirements: As listed above.

Secondary Route Major Fields

Each candidate must select a major field of study. Courses are to be chosen according to the patterns listed below.

Major Field	Prescribed Core	Supporting Courses
I. English	1. English 288 2. Three of English 332, 356, 364, 373, 380, 383, 388, 392, 393, 396, or Linguistics 389 3. 4. 5. Any senior English course, Linguistics 389, or Drama 240	6. Any two senior 7. English courses or Two approved courses in history, foreign language, the fine arts, classics, or linguistics
II. French	1. French 201 2. French 330 3. Linguistics 370 4. One of French 360, 370, 375, 380, or 399 5. French 400	6. Any one of the courses 7. listed under 4 and a senior Arts option or Two approved courses in history, English, or other languages
III. German	1. German 200 2. German 330 3. German 350 4. Two senior German 5. courses	6. Any senior German 7. course and a senior Arts option or Two approved courses in history, English, or other languages
IV. Latin	1. Latin 200 2. Latin 300 3. Latin 373 4. Latin 374 5. Latin 375	6. Classic 350 or 351 7. Classics 353 or a senior Latin course or Two approved courses in history, English, or other languages
V. Other Foreign Languages	1. 2. 3. Any five approved courses 4. 5.	6. Two approved courses 7. in history, English or other languages
VI. Social Studies	1. History 200 2. History 370 3. Geography 201 4. Geography 300	5. Two approved social 6. science courses or history, one of which must be in a field other than history or geography 7. Approved senior social science or history course

Major Field	Prescribed Core	Supporting Courses
VII. Mathematics	1. Mathematics 274 2. Math. 201 or 207 or 180 3. Mathematics 374 4. Approved senior mathematics 5. Statistics 255	6. } Two senior mathematics 7. } courses or Two approved courses in a related field
VIII. Biological Sciences*	1. Biology 130 2. Biology 230 3. Approved senior zoology 4. } Chemistry 230 5. } Chemistry 350 or Chemistry 250 Approved senior zoology, botany, entomology, or genetics course	6. Approved senior botany course 7. Approved senior course in biology, biochemistry, entomology or genetics
IX. Physical Sciences*	1. Chemistry 230 2. Math. 207, or 201, or 220 3. Physics 200 or 240 4. Chemistry 350 5. Approved senior physics course	6. Approved senior physics or chemistry course 7. Approved course in chemistry, physics, geology, astronomy, meteorology or physical geography
X. Art	1. Art 200 2. Art 230 3. Art 240 4. Art 250 5. One of: Art 300, 330, 400 or Philosophy 350	6. } Two approved options 7. } in a related field

*Students who enter this program with credit in Biology 30 (or equivalent) are not required to take Biology 130. Instead, they will move directly to the second course on the major pattern and take an **approved botany course** to complete the prescribed core.

*Careful attention should be given to the mathematics prerequisites or corequisites for physics courses.

Major Field	Prescribed Core	Supporting Courses
XI. Music	1. Music 200 2. Music 300 3. Music 400 (or 250 with approval) 4. } Any two of Music 250, 5. } 400, 311, 350, or 450 or Philosophy 350	6. } Any two of the courses 7. } listed under 4 and 5 or Two approved options in a related field
XII. Drama	1. Drama 250 2. Drama 240 3. Drama 270 4. Drama 480 5. Drama 300 or 400	6. } Two senior drama 7. } courses or Two approved courses in a related field
XIII. Household Economics	1. Chemistry 250 2. H.Ec. 201 and 221* 3. H.Ec. 203 and 307 4. H.Ec. 321* and 325 5. H.Ec. 303 and 355	6. H.Ec. 350 7. Approved household economics option or An approved option in a related field
XIV. Business Education		
(a) Secretarial	1. Ed. Bus. 346 or 246 and 345 .2 Ed. Bus. 348, or 248 and 347 3. Accounting 200 4. Ed. Bus. 350 5. Business Law 310	6. } Two approved options 7. } in a related field
(b) Accounting-Clerical	1. Ed. Bus. 346, or 246 and 345 2. Accounting 200 3. Ed. Bus. 350 4. Business 250 5. Business Law 310	6. } Two approved options 7. } in a related field

*In the 1966 Summer Session, H.Ec. 210 will replace H.Ec. 221 and 321 in the above program.

Use of Options

Students should give careful consideration to the various opportunities provided by the two Arts/Science Options and the two Education Options in the Secondary B.Ed. program. These may be regarded as "free" options and used to explore a variety of fields; or they may be patterned in such a way as to provide some preparation for certain functions related to teaching in the Secondary School.

The following are illustrative of the ways in which these courses may be patterned:

1. *Guidance in the Secondary School*
   - Two of Ed. Psy. 308, 310, or 478
   - *and*
   - Two of Soc. 360, Soc. 370, Psych. 353 and 383
   - *or*
   - Statistics 255 and two of Soc. 341, Soc. 343 or Psych. 336
2. *Further Specialization in Teaching Field*
   - Two Arts or Science courses in the major field
   - One advanced Curriculum and Instruction course
   - One supporting Education option
3. *Physical Education in the Secondary School*
   - Physical Education 232 and 332
   - Ed. CI 498
   - A related Education option
4. *Teaching in the Junior High School*
   - Two Arts or Science options (selected to give breadth)
   - Two Education options
5. *Library Services in the Secondary School*
   - Ed. CI 346, Ed. CI 446, Eng. 398 or an Arts option, and
   - a selected Arts or Science option

Other patterns will be available in speech, special education, etc.

Students are urged to plan the patterning of these courses in consultation with the Dean or the Department Head.

THE B.ED. IN INDUSTRIAL ARTS

The following program has been designed to meet the needs of teachers of Industrial Arts. It is available only at Edmonton. Teachers already embarked on other B.Ed. programs may transfer to this program on consultation with the Dean.

Degree Program for Certificated Teachers

Second Year

1. Ed. IA 203
2. English 200 or 210
3. Approved Mathematics course
4. Ed. IA 260
5. Approved Chemistry course
6. Approved Physics course
7. Ed. IA 270

Third Year

1. Ed. Psy. 476
2. Philosophy 240 or 242
3. Approved Arts or Science option
4. Ed. IA 360
5. Ed. IA 370

Fourth Year

1. Ed. Fdn. 492
2. Approved Social Science course
3. Ed. IA 350
4. Ed. IA 460
5. Ed. IA 470

THE B.ED. IN VOCATIONAL EDUCATION

First Year

1. Trade training as verified by a recognized Certificate of Qualification as a Journeyman for a designated trade or equivalent for a non-designated trade.
2. Experience in a trade or industry calling for the trade training held by the candidate.

Second Year

1. Ed. Fdn. 201
2. Ed. Adm. 261
3. Ed. Voc. 204
4. Ed. Psy. 276
5. English 210
6. Ed. Voc. 280
7. Ed. CI 250

Third Year

1. Ed. Psy. 476
2. Philosophy 240 or 242
3. Ed. Voc. 350
4. Junior Arts or Science option
5. Junior Arts or Science option

Fourth Year

1. Ed. Fdn. 492
2. Ed. Voc. option
3. Senior Arts or Science option
4. Senior Arts or Science option
5. Senior Arts or Science option

Notes on the Program:

1. One Arts or Science sequence to be directly related to vocational education.
2. One Arts or Science sequence to provide an element of general education.

B.ED. PROGRAMS FOR HOLDERS OF APPROVED DEGREES

General Requirements

(Applicable to all programs)

1. Students following these programs are required to complete one year of intramural attendance as full-time students before they will be recommended for a teaching certificate.
2. Students entering these programs lacking credit in the prerequisites for Ed. Psy. 476 or Ed. Fdn. 492 or both will be required to remove deficiencies. Such students, however, will be permitted to register in special six-course programs that will lead to the Standard E or S Certificate. With five additional courses they can qualify for the B.Ed. degree. For further details consult the Education Calendar.
3. The holders of an approved Honors or Master's degree may qualify for the B.Ed. degree by completing the first eight of the required courses and meeting the graduation requirements.
4. **Graduation Requirements:**
   (a) An average of at least 60 per cent on all courses taken at the University of Alberta and credited towards the degree.
   (b) Students in these programs may not write more than two supplemental examinations for the purpose of obtaining passing marks or raising the average to 60 per cent.

Program for Teachers in the Secondary School

First Year

1. Ed. Adm. 461
2. Ed. Psy. 476
3. Ed. CI 450
4. Ed. Fdn. 492
5. Education: Curriculum and Instruction (major field)
6. Ed. Fdn. 414 or Ed. Psy. 478

(Satisfactory completion of these six courses permits the student to obtain the Interim Professional Certificate)

Second Year

(7-11) Five approved courses, at least two of which must be in Education and at least two of which must be in Arts or Science.
(Satisfactory completion of all eleven courses permits the student to apply for the B.Ed. degree)

Notes on the Program:

1. Students who present a degree which does not contain the equivalent of a major as required in the regular secondary route B.Ed. will be required to make up the deficiency before proceeding with this program. A maximum of two courses taken for this purpose may be credited toward the degree.
2. Holders of the B.Com. degree wishing to enter the business education program must have credit in Typewriting 10 of the high school or its equivalent. Students who are deficient in this respect should remove

the deficiency by registering in Ed. Bus. 246 in the summer session prior to enrolling in the winter session.

3. Certificated Candidates (Jr. E. or equivalent) will complete items 2, 4 and 5 above for the Professional Certificate. To obtain the B.Ed. degree, such candidates will present, in addition, items 7 to 11 (inclusive) of the program.
4. Provision can be made in the program for further specialization in subject fields, guidance and counselling, library services, and the like.
5. Students interested in qualifying for a Master's degree or Graduate Diploma rather than for the B.Ed., following the Professional Certificate year, should consult the appropriate department regarding requirements.

Program for Teachers in the Elementary School

First Year

1. Ed. Adm. 461
2. Ed. Psy. 476
3. Ed. CI 400
4. Ed. Fdn. 492
5. Ed. CI 402
6. Ed. CI 404

(Satisfactory completion of these six courses permits the student to obtain the Interim Professional Certificate)

Second Year

(7-11) Five approved courses, at least two of which must be in Education and at least two of which must be in Arts or Science.

(Satisfactory completion of all eleven courses permits the student to apply for the B.Ed. degree)

Notes on the Program:

1. Students who present a degree which does not contain the equivalent of a major as required in the regular elementary route B.Ed. will be required to make up such deficiencies before proceeding with this program. A maximum of two such courses may be credited toward the degree.
2. Certificated Candidates (Jr. E. or equivalent) will complete items 2 and 4 for the Professional Certificate. To obtain the B.Ed. degree, such candidates will present, in addition, items 7 to 11 (inclusive) of the program.
3. Provision can be made in the program for specialization in subject fields, primary education, reading, education of exceptional children and the like.
4. Students interested in qualifying for a Master's degree or Graduate Diploma rather than for the B.Ed., following the Professional Certificate year, should consult the appropriate department regarding requirements.

Program for Vocational Education Teachers

First Year

1. Ed. Adm. 461
2. Ed. Psy. 476
3. Ed. Voc. 480

4. Ed. CI 450
5. Ed. Fdn. 492
6. Ed. Voc. 404

(Satisfactory completion of these six courses permits the student to obtain the Interim Professional Certificate)

Second Year

(7-11) Five approved courses, at least two of which must be in Education and at least two of which must be in Arts or Science.

(Satisfactory completion of all eleven courses permits the student to apply for the B.Ed. degree)

Notes on the Program:

1. Candidates must hold a Journeyman's Certificate or have had preparation and experience recognized by the University as equivalent.
2. Certificated Candidates (Jr. E. or equivalent) will complete items 2, 3, and 6 for the Professional Certificate. To obtain the B.Ed. degree, such candidates will present, in addition, items 7 to 11 (inclusive) of the program.
3. Provision can be made in the program for further specialization in subject fields, guidance and counselling, library services, and the like.
4. Students interested in qualifying for a Master's degree or Graduate Diploma rather than for the B.Ed., following the Professional year, should consult the appropriate department regarding requirements.

ADVANCED STUDY IN EDUCATION

Graduate Diploma Programs in Education

The Faculty of Education sponsors a series of diploma programs providing additional special qualification in designated areas. Admission to the Graduate Diploma Program will be granted to holders of an approved degree and a Professional (in some Departments the Permanent Professional) Teaching Certificate or its equivalent. Normally, courses taken prior to the 1963 Summer Session may not be credited toward the Diploma unless the student is currently a candidate for the M.Ed. degree. Students who now hold the M.Ed. degree may not obtain the Diploma on the basis of courses taken on the M.Ed. degree program. Courses credited toward the Diploma may not also be credited toward the B.Ed. degree. The pass mark for courses to be credited toward the Diploma is 65%. Residence requirements for the Diploma may be met in consecutive summer sessions or in a winter session.

Diploma programs are offered by all Departments of the Faculty. Enquiries should be directed to the office of the Department concerned.

When a diploma program has been completed the student must apply to the Dean's office for the diploma on the form provided by the department concerned. Diplomas are not issued until formal application has been made.

Graduate Degrees in Education

All candidates for advanced degrees register with the Faculty of Graduate Studies which administers graduate programs throughout the University.

In the Faculty of Education graduate work is offered for the preparation of teachers, supervisors, guidance workers, administrators and other educational

specialists, and may lead to the degrees of Master of Education, Doctor of Education and Doctor of Philosophy. Candidates for these advanced degrees specialize in terms of the departmental organization of the Faculty of Education as follows:

Department of Elementary Education: curriculum and instruction in kindergarten and elementary education. Head—Dr. W. H. Worth.

Department of Secondary Education: curriculum and instruction in secondary education. (Grades VII-XII). Acting Head—Dr. G. L. Berry.

Department of Educational Foundations: philosophy, sociology, and history of education. Head—Dr. B. E. Walker.

Department of Educational Psychology: child and adolescent psychology, educational psychology, guidance, mental hygiene, special education, clinical psychology, tests and measurements. Head—Dr. G. M. Dunlop.

Department of Educational Administration: school administration (elementary and secondary), general supervision, school finance and business administration, chief administrative roles. Head—Dr. A. W. Reeves.

Department of Industrial and Vocational Education: industrial arts and vocational education. Head—Dr. H. R. Ziel.

In order to meet the needs and interests of candidates, the departments permit considerable flexibility in the programs leading to advanced degrees. In general, students pattern their courses from the offerings of the department of their choice supplemented by approved courses from other departments of the University. Normally a candidate for the master's degree must present a program consisting of six courses and a minor thesis, and is required to spend at least one academic year in study and research in residence at the University of Alberta. A candidate for the doctor's degree (if he already holds a master's degree) is normally required to spend two academic years in study and research in residence at the University of Alberta.

Graduate courses in education are offered in both the regular and the summer sessions.

Initial Procedure: Students who wish to inquire about graduate programs should address all preliminary inquires to the Dean of the Faculty of Graduate Studies, University of Alberta, Edmonton.

After a student has decided upon an area of specialization, he should communicate directly with the appropriate department head, and if possible, arrange for an interview. By this means the student's eligibility will be determined and further information given about the degree programs available in the Department.

Prospective candidates should also refer to the section of this Calendar which deals with the Faculty of Graduate Studies.

Special Students

A student holding a B.Ed. degree or the equivalent and not desiring to register for a graduate degree or not meeting all the requirements for admission to the Faculty of Graduate Studies, may register in the Faculty of Education as a special student.

LEADERSHIP COURSE FOR SCHOOL PRINCIPALS

A special Leadership Course for School Principals will be held in Concordia College as part of the 1966 Summer Session.

The course has been developed by the Alberta Trustees' Association, the Alberta Teachers' Association, the Alberta School Inspectors' Association, the Alberta Department of Education, and the Faculty of Education in an effort to improve the quality of leadership at the school level.

It will be a seminar type of activity with the program built around the interests and concerns of the course members. While the course is under the official direction of the Faculty of Education, it will not carry degree credit nor will there be any examinations.

Participation will be limited to 70 experienced principals sponsored by their school boards. The cost per member will be payable by the employing school board. It is expected that course members will live in residence at Concordia College for the two-week period.

Course members will be selected by the end of February. Interested principals should consult with their local superintendents and/or school boards for further details. Other information as needed may be obtained by writing to The Director, Leadership Course for School Principals, Division of Educational Administration, Faculty of Education, University of Alberta, Edmonton.

FACULTY OF GRADUATE STUDIES

The Faculty of Graduate Studies administers programs leading to the degrees of Master of Arts, Master of Education, Master of Science, Master of Business Administration, Doctor of Education and Doctor of Philosophy, and makes recommendations for granting the degrees of Doctor of Science and Doctor of Letters. Graduates who have not been accepted as candidates for degrees may register as "conditional" or "probationary" graduate students if they are eligible and desirous of seeking admission to candidacy at a later date. "Special" graduate students may also be accepted in the Faculty.

Students proposing to do graduate work in the Summer Session leading to the M.A., M.Ed., and M.Sc. degrees should familiarize themselves with the regulations and procedures set forth in the Calendar of the Faculty of Graduate Studies, which may be obtained from the Registrar. A few of the more important general regulations are given below.

Admission

Application for admission to the Faculty of Graduate Studies must be filed not later than April 1 on forms supplied by the Dean of that faculty. A graduate of another University must arrange with the Registrar of that institution to forward two transcripts of his academic record to the Dean of the Faculty of Graduate Studies prior to April 1. The Dean may require the applicant to furnish an official description of the content of the courses listed on the transcript.

Registration

An applicant accepted by the Faculty as a candidate or provisional candidate for an advanced degree or as a "probationary" or "conditional" graduate student, is required:

(a) to register not later than May 2 if he proposes to work on his program in the Summer Session;

(b) to maintain continuous registration during his program by registering once a year. This registration entitles students to the use of university facilities and to assistance from their supervisors for a 12-month period. Registration during the final year of the program permits the student to graduate at either of the two following convocations.

A student who fails to maintain continuous registration will be considered to have withdrawn from his program. If he wishes to resume studies on the program, he must apply for readmission to the Faculty of Graduate Studies and have his program reassessed in terms of the regulations in force at the time of reapplication.

(c) to file with each set of registration forms a program of studies signed by the head of the department or division responsible for his graduate study program. (Registration and program forms may be obtained from the office of the Dean of the Faculty of Graduate Studies and must be returned to that office when completed.)

Thesis and Oral Examination

A candidate planning to graduate at the Fall Convocation must submit his thesis not later than October 3 and pass an oral examination not later than October 20.

SUMMER SCHOOL OF LINGUISTICS

The University will conduct a Summer School of Linguistics during the 1966 Summer Session. In so doing, the University recognizes the growing need for linguistically trained scholars, teachers, and governmental personnel. It is expected that the Summer School of Linguistics will be of interest not only to those who wish to embark on or continue a study of Linguistic Science as a major subject but also

(a) to teachers of English and foreign languages in high schools, colleges, and universities who wish to apply to language teaching the methods and results of modern linguistic science;

(b) to advanced undergraduates and graduate students in such fields as English, Modern and Classical Languages, Anthropology, Philosophy, Psychology, and Sociology who may wish to combine the study of Linguistics with their major subject; and

(c) to others such as museum and library staff, civil servants, and missionaries to whom a knowledge of linguistics is of value.

The following courses, described elsewhere in this Announcement, will be offered. All of these courses may be taken for University credit.

Education CI 340—Teaching English as a Second Language
English 288 —Introduction to the English Language
Linguistics 305 —Culture and Language
Linguistics 350 —General Linguistics
Linguistics 370 —Contrastive Linguistics: French and English
Linguistics 387 —Linguistic Geography
Linguistics 389 —Modern English Grammar
Linguistics 470 —American Indian Linguistics
Linguistics 699 —Conference Course: Studies in Dialectology

Regulations concerning admission, registration, fees, pre-session study and examinations are the same as those for other courses offered in the Summer Session and may be found in the General Section of this Calendar.

A brochure giving full details concerning the Summer School of Linguistics is available on request from the Summer Session office. Additional information may be obtained from Dr. W. F. Klatte, Director, Summer School of Linguistics, Department of Linguistics, University of Alberta, Edmonton, Alberta, Canada.

EVENING CREDIT PROGRAM

Through its Evening Credit Program, the University of Alberta, Edmonton, offers credit courses at various centres in Northern Alberta in the evening. The purpose of this program is to enable persons employed during the day either to commence or to continue their university studies. The courses provided are selected primarily to meet the needs of students working towards the following degrees: B.Ed., B.A., B.Com. (first two years only).

In 1966-67 courses probably will be offered at the following centres: Edmonton, Camrose, Evansburg, Grande Prairie, Viking, Radway, Red Deer, Vegreville, Westlock, and Wetaskiwin.

Information about courses to be offered will be circulated through the schools in the above areas as soon as it comes available.

DETAILS OF COURSES

Notes:

1. The University reserves the right to limit registration in, or to withdraw, any of the courses here outlined.
2. The number of hours of instruction per week is shown at the top of each course description. The first figure in a set of two indicates lecture-hours; the second, laboratory hours: The letter "L" attached to a figure signifies lecture-laboratory-hours, and the letter "S" seminar-hours.
3. Only courses marked with an asterisk (*) may be presented for credit on B.A. or B.Sc. degrees.

ACCOUNTING

***Acctg 200** (10-8)

Management Accounting—The language of accounting, forms of business organizations, and accounting implications stressing managerial requirements.

ANTHROPOLOGY

***Anthr 202**—Louise Sweet and Shirley Keith (10-0)

Introductory Anthropology—An introduction to the field of anthropology, including human paleontology, race, human prehistory, linguistics and ethnology.

***Anthr 305**—T. C. Correll (10-0)

Culture and Language—An inquiry into the nature of human communication, its cultural conditions and consequences. Special attention will be given to the interrelations of the linguistic structures and habitual modes of behaviour and thought of various societies.

***Anthr 420**—R. Frucht (10-0)

Anthropology of Religion—A study of supernatual beliefs and practices in primitive and peasant cultures, including magic, shamanism, priesthood, taboos and folk-beliefs. Special attention will be given to evolutionary, historical and functional theories of religion.

Prerequisite: A course in anthropology or sociology, or written consent of the Department of Anthropology.

Note: Consent of department where required must be filed with registration forms.

ART

***Art 200**—Ruth Ford and Anne Willis (10-0)

Introduction to the History of Art—Beginning with a discussion of fundamental concepts underlying painting and the plastic arts, this course investigates the major styles and contributions of each important period.

Note: This course will be offered in two sections scheduled for different hours (see timetable). When registering students should indicate their choice of section.

***Art 230**—D. Cantine and Associates (20L)

Fundamentals of Design—The theory and practical application of principles of composition and picture-making, methods of construction in design, and the use of conventional and abstract forms.

***Art 240**—R. W. Sinclair (20L)

Fundamentals of Drawing—Theory and practice, analysis of masters' drawings; study of line, form, light and shade; portrait and figure construction; life drawing, using both long and quick poses.

***Art 400**—G. G. Goetemann (10-0)

European Art, 17th to 19th Century—A study of the French, Flemish, Dutch, Spanish, German and English schools from 1600 to the middle of the 19th century.

ASTRONOMY

***Astro 253**—E. Phibbs (10-0)

Astronomy—History of early astronomy, study of the earth, astronomical coordinates, time. The solar system, the stars, structure of the universe, origin of the solar system. Practical work; study of the constellations; discussion of articles in current journals.

Prerequisite: Mathematics 30. Some knowledge of trigonometry is required and students are advised also to have credit in Mathematics 31.

BIOLOGY

***Biol 130**—J. H. Whyte and Associates (10-12)

Introductory Biology—An introduction to biology, with emphasis on principles. Not open to students with credit in Biology 30.

***Biol 230**—D. D. Beatty and Associates (10-12)

Intermediate Biology—Comparative morphology and physiology of plants and animals, designed for students with High School Biology 30. This course is prerequisite to most senior biology courses.

Prerequisite: Biology 30 or Biology 130.

BUSINESS LAW

B Law 310—L. C. Leitch (10-0)

Commercial Law—An introduction to the study of commercial law with special reference to the law of contracts; Bills of Sale, chattel mortgages and conditional sales; sales of goods; bulk sales; contract of hiring; contracts of carriage including bills of lading; negotiable instruments; guarantees; real property; commercial associations including companies, partnership and agency; master and servant.

CHEMISTRY

***Chem 230**—T. Jones (10-12)

Inorganic Chemistry—Lectures: The fundamental concepts of chemistry as applied to the elements and their compounds.

Laboratory: The preparation of some compounds; quantitative chemistry, and semi-micro qualitative analysis.

Prerequisite: Chemistry 130 or Chemistry 30 or equivalent.

CLASSICS

***Class 352**—D. W. Knight (10-0)

History of Ancient Greece: The Influence of the Greek Genius on the Western World—The story of the Hellenic world from its beginnings in the Minoan-Mycenaean civilizations of Crete and Greece until the time of Alexander the Great with special attention to the political organization of the city-state and the beginnings of democracy, and to cultural and economic development.

***Class 354**—E. C. May (10-0)

History of Ancient Art—A history of the rise and progress of ancient art from the Cretan period through the Graeco-Roman age. An examination of the aims and principles underlying ancient art. The course will be fully illustrated from the department's collection of slides and photographs.

***Class 358**—R. C. Smith (10-0)

History of the Roman Empire—A study of the Roman Empire and its rule over the Mediterranean world. Particular attention will be paid to imperial government, law and civilization; to the decline and fall; and the influence on Byzantine and western European culture.

COMPUTING SCIENCE

***Cmput 310** (10-0)

Logical structure of computers; instructions, algorithms and programs; language of computer programming; conventional computers; assemblers and compilers.

DRAMA

***Drama 240 (formerly 360)**—C. T. Peacocke (10-0)

Voice and Speech—An intensive course in voice and speech improvement with an emphasis upon the oral interpretation of prose, poetry and dramatic literature.

***Drama 270**—L. Feldman (10-10)

Stagecraft—Construction and handling of scenery and properties, lighting and sound, costumes, elements of production, planning, backstage organization; practical work in construction and crew performance for major productions.

***Drama 400**—F. F. Bueckert (10-0)

The Modern Theatre—The development of the modern theatre from Ibsen to the present day. The aesthetics of the theatre. A considerable amount of outside reading will be assigned throughout the session, including the reading of plays and critical essays.

***Drama 480**—G. Peacock (10-10)

Directing Techniques—

(a) A study of the problems of play selection, casting, preparation of a script and conduct of rehearsals; techniques involved in production.

(b) Practical—Each member of the class will be responsible for the preparation of a complete director's script.

Prerequisite: Drama 250.

ECONOMICS

***Econ 200**—P. Jenson (10-0)

Principles of Economics—A survey of various aspects of economics; the nature of economic problems and systems; the functions of money; commercial and central banking; national income analysis; monetary and fiscal policy; pricing under competitive and monopolistic conditions; selected topics in analysis and policy.

Prerequisite for all senior economics courses except 310, 311.

***Econ 310**—R. A. Pendergast, C.S.B. (10-0)

Canadian Economic Development—The relative growth of various industries and the regional distribution of economic activity with emphasis on the role of export staples, technology, capital accumulation and government.

***Econ 390**—I. Moravick (10-0)

Comparative Economic Systems—A comparative study of the institutions and theories of important contemporary economics and systems of economic organization, with emphasis on the "mixed" capitalist system, "command" economies of the Soviet type, and transitional systems embodying socialist as well as capitalist principles. A survey of socialist economic thought with emphasis on the economics of Marx.

Prerequisite: Economics 200 strongly recommended, but may be waived.

EDUCATION: Educational Administration

Ed Adm 461—E. Ratsoy (10-0)

The Role of the Teacher—A basic course in educational administration dealing with topics of special significance to the classroom teacher. For holders of approved degrees.

Ed Adm 526—D. A. MacKay (10-0)

Administration of Educational Personnel—The supervisory functions of staffing, consulting, and motivating, including such topics as selection and placement, teacher evaluation, in-service training, individual consultation leadership, teacher morale, use of authority, and organization for supervision.

Ed Adm 560 (10-0)

Administration of Public Education in Canada—The legal basis of structure and control. Organizational and operational features of provincial school systems. Current administrative problems.

Ed Adm 562—A. W. Reeves (10-0)

Evolving Concepts in Educational Administration—Administrative behavior in relation to educational purposes, processes and situations.

Ed Adm 564—J. E. Seger (10-0)

Administration of the Educational Program—Patterns of school organization, curriculum adaptation, staff utilization, pupil personnel practices, program evaluation, and learning materials.

Ed Adm 566—E. B. Rideout (10-0)

Educational Finance—Sources of school revenue and analysis of expenditures. Provincial school grants in Canada. The case of federal aid. Plans for equalizing the financial support of public education and major problems involved in their implementation. Principles and practices in the budgeting of school funds. Financial accounting and reporting. Capital expenditures. Salary schedules. Cost analysis.

EDUCATION: Business Education

Ed Bus 246 (10-10)

Teaching of Typewriting—Typewriting, and the teaching of typewriting in the secondary school. Open to students not eligible for admission to Ed Bus 346.

Ed Bus 345 (0-10)

Typewriting Practice—Advanced Typewriting.

Prerequisite: Ed Bus 246.

Note: Required of candidates who present Ed Bus 246 for credit on the major in business education.

Ed Bus 346 (10-10)

Teaching of Typewriting—Advanced typewriting, and the teaching of typewriting in the secondary school.

Prerequisite: Typewriting 20 of the high school with B standing, or the Junior Certificate in Typewriting.

Note: Students who do not show sufficient competence in typewriting will be required to register in Ed Bus 246. Not open to students who hold credit in Ed Bus 246.

Ed Bus 350 (10-10)

Office Training—Office organization and services with special reference to business communication and filing procedures. Introduction to business machines and data processing.

Prerequisite: Ed Bus 246 or equivalent.

EDUCATION: Curriculum and Instruction

Ed CI 209—R. B. Reinholtz (10L) (1st 3 wks.)

Curriculum and Instruction in Elementary School Art.

Ed CI 227—J. W. G. Ivany (5L)

Curriculum and Instruction in Elementary School Mathematics.

Ed CI 231—J. W. G. Ivany (5L)

Curriculum and Instruction in Elementary School Science.

Ed CI 286—Grace Duggan (10-0)

Curriculum and Instruction in Secondary School Household Economics.

Prerequisites or corequisites: Three full-year courses or the equivalent on the major in household economics.

Ed CI 340 (formerly 438)—R. Wardhaugh (10-0)
Teaching English as a Second Language.
Prerequisites: A teaching certificate, and an approved course in linguistics.

Ed CI 341-343—W. Buys (10-0)
Speech Education in the Elementary School.
Prerequisite: A teaching certificate.
Note: This course is not open to students with credit in Ed CI 342.

Ed CI 346 (formerly 316)—Elizabeth McCallum (10-0)
School Library Services.
Prerequisite: A teaching certificate.

Ed CI 361 (formerly 362)—W. R. Dralle (5L)
Audiovisual Instruction—Theory of audiovisual intruction; types of communications media; principles and techniques of teaching with such media; preparation of selected audiovisual materials; operation and care of specialized equipment.
Note: This course will be offered in two sections scheduled for different hours (see timetable). When registering students should indicate their choice of section.

Ed CI 406 (formerly 306)—Evelyn R. Moore (10-0)
Social Studies in Elementary Education.
Prerequisites: Ed CI 205 or equivalent, and at least one basic course in the social sciences including history.

Ed CI 410 (formerly 310)—B. Schwartz (10-0)
Art in the Elementary School.
Prerequisites: Ed CI 209 or equivalent, and at least one laboratory or studio course in art.

Ed CI 414 (formerly 314)—R. L. Ware (10-0)
Music in the Elementary School.
Prerequisites: Ed CI 213 or equivalent, and at least one course in music.

Ed CI 420 (formerly 320)—Muriel A. Affleck (10-0)
Reading at the Primary Level.
Prerequisites: Ed CI 221 or equivalent, and teaching experience or fourth year standing.

Ed CI 422 (formerly 322)—Phyllis Sutherland (10-0)
Reading at the Upper Elementary and Secondary Levels.
Prerequisite: A teaching certificate.

Ed CI 428 (formerly 328)—L. D. Nelson (10-0)
Mathematics in Elementary Education.
Prerequisites: Ed CI 227 or equivalent, and at least one course in mathematics.

Ed CI 432 (formerly 332)—N. M. Purvis (10-0)
Science in Elementary Education.
Prerequisites: Ed CI 231 or equivalent, and at least one laboratory science course.

Ed CI 436 (formerly 336)—Sister Yolande and Madeleine Monod (10-0)
French in the Elementary School.
Prerequisites: A teaching certificate and French 201, or written consent of Department of Elementary Education.
Note: Consent of department where required must be filed with registration forms.

Ed CI 438 (formerly 338)—Patricia A. Lane (10-0)
Language in Elementary Education.
Prerequisites: Ed CI 237 or equivalent, and **one** of English 288, English 388, or Linguistics 389.

Ed CI 446—Grace d'Arcy (10-5)
Selection and Organization of Library Materials.
Prerequisite: Ed CI 346.

Ed CI 456—J. Cameron (10-0)
Advanced Curriculum and Instruction in Secondary School English.
Prerequisites: Ed CI 254 or 454 or written consent of the Department of Secondary Education.
Note: Consent of department where required must be filed with registration forms.

Ed CI 460—Madeleine Monod (10-0)
Advanced Curriculum and Instruction in Secondary School Foreign Languages.
Prerequisites: Ed CI 258 or 458 or written consent of Department of Secondary Education.
Note: Consent of department where required must be filed with registration forms.

Ed CI 476—C. G. Hampson (10L)
Advanced Curriculum and Instruction in Secondary School Biological Sciences.
Prerequisite: Ed CI 274 or 474 or written consent of Department of Secondary Education.
Note: Consent of department where required must be filed with registration forms.

Ed CI 496—A. A. Smith and Associates (20L)
Advanced Curriculum and Instruction in the Fine Arts—Music.
Prerequisite: Written consent of Department of Secondary Education.
Note: Consent of department must be filed with registration forms.

Ed CI 538—R. D. Armstrong (10-0)
Program Development in Elementary School Language.
Prerequisite: Ed CI 338 or written consent of Department of Elementary Education.
Note: Consent of department where required must be filed with registration forms.

Ed CI 580—R. R. Rath, L. Stewart and Associates (10-0)
Curriculum Development—Curriculum research, theory and practice with particular reference to curriculum aims, content, organization, and change.

EDUCATION: Educational Foundations

Ed Fdn 414—S. A. Earl (10-0)

Sociology of the School—Study of the school as a social institution in the changing society.

***Ed Fdn 492**—B. E. Walker and Associates (10-0)

Philosophy of Education.

Prerequisite: Philosophy 240 or 241 or 242. For holders of approved degrees other basic philosophy courses may be accepted by the department.

Ed Fdn 581-583—K. H. Thomson (10-0)

History of Education in Western Europe and the United States.

EDUCATION: Industrial Arts and Vocational Education

Ed IA 203—H. R. Ziel (5-0)

Introduction to Industrial Arts—An examination of past and present theory and practice in industrial arts education.

Ed IA 260—A. Meyers (10-20)

General Industrial Arts—Development of basic knowledge and skill in the following: ceramics, electricity, graphic arts, metals, plastics, wood; organization and management of multiple-activity laboratories.

Ed IA 270—H. D. Tichenor (10-20)

Introduction to Technology—Development of basic knowledge and skills in the following technological areas; computer, electricity-electronics, graphic communications, materials and processes, mechanical, power; organization and management of multiple-activity laboratories.

Ed IA 370—M. W. Petruk (20L)

Technology I—Development of competence in computer, electricity and electronics technologies.

Prerequisite: Ed IA 270.

Ed IA 589—H. R. Ziel (5-0)

Organization of Industrial Arts Education.

Corequisite: Ed IA 591.

Ed IA 591—H. R. Ziel (5-0)

Problems and Trends in Industrial Arts Education.

Corequisite: Ed IA 589.

Ed Voc 589—H. R. Ziel (5-0)

Organization of Vocational Education.

Corequisite: Ed Voc 591.

Ed Voc 591—H. R. Ziel (5-0)

Problems and Trends in Vocational Education.

Corequisite: Ed Voc 589.

EDUCATION: Educational Psychology

Ed Psy 276—Anne Dockrell (10-0)

Introduction to Educational Psychology—An introduction to childhood and adolescence, stressing physical, mental, social, emotional, and personality development; the psychology of learning and of the special learning areas; the application of psychological principles to classroom practice.

Ed Psy 308—J. D. Friesen (10-0)

Guidance—Basic principles and techniques of guidance; case studies, interviews, records, with emphasis on scholastic and personal guidance; introduction to the tests and measures most commonly used in guidance.
Prerequisite: Ed Psy 276 or equivalent.

Ed Psy 354—D. R. Cameron (10-5)

Psychology and Education of Exceptional Children—Survey course for teachers of atypical children in regular and special classrooms. Observation in selected centres and schools.
Prerequisite: Ed Psy 276 or equivalent.

Ed Psy 458—Rivkah Bartell (10-5)

Psychology and Education of Emotionally Disturbed and Socially Maladjusted Children—Theory, observation and practice.
Prerequisite: Ed Psy 354 or written consent of Department of Educational Psychology.
Note: Consent of department must be filed with registration forms.

***Ed Psy 476**—G. M. Dunlop and Associates (10-0)

Educational Psychology—Individual differences; psychology of learning and forgetting; motivation; personality, adjustment, and mental hygiene; introducation to evaluation and the testing program.
Prerequisite: Ed Psy 276 or Psychology 202 or equivalent.

Ed Psy 478—F. J. Boersma and J. C. Powell (10-0)

Measurement and Evaluation—Measurement of classroom achievement; teacher-made and standardized tests; interpretation and use of test results; evaluation of non-academic achievement; recording and reporting pupil progress.
Prerequisite: Ed Psy 276 or equivalent.

Ed Psy 502—V. R. Nyberg and R. Gupta (10-5)

Introduction to Educational Research—Quantitative and non-quantitative research with applications of elementary statistics to the collection and analysis of data.

Ed Psy 508—D. C. Fair (10-5)

Problems in Educational and Vocational Guidance—Theories of vocational development and choice; group standardized tests and inventories.
Prerequisite or corequisite: Ed Psy 476.

Ed Psy 570—W. B. Dockrell (10-0)

Child Psychology—A systematic study of the growth, development, behavior and problems of adjustment of children of pre-school and elementary school ages.
Prerequisite: Ed Psy 476.

ENGLISH

***Engl 200**—S. Dragland and N. Henry (10-0)

A Survey of English Literature from Chaucer to the Twentieth Century—A close study of representative masterpieces. Essays and tests of the prescribed literature will be given to afford practice in setting down ideas in good English.

Note: English 200 may not be taken concurrently with another course.

***Engl 210**—R. Ellenwood and Jeanne Henry (10-0)

English Language and Literature—English 210 is designed to increase appreciation of good literature and to afford practice in setting down ideas in good English.

Note: English 210 may not be taken concurrently with another course.

***Engl 288**—W. Kirchmeir and N. Parker-Jervis (10-0)

An Introduction to the English Language—An historical and structural study of the sounds, grammar, and vocabulary of English.

***Engl 314**—G. F. Chapin (10-0)

Middle English Literature—An introduction to some of the characteristic themes and forms of English literature between 1200 and 1500, excluding Chaucer and the Chaucerian tradition.

Prerequisite: English 200 or 210.

***Engl 332**—G. S. McCaughey and H. A. Hargreaves (10-0)

Shakespeare—A study of Shakespeare's major plays. Eighteen plays will be covered, not all in great detail. Among the eighteen will be the following: *Love's Labour's Lost, As You Like It, The Tempest, Troilus and Cressida, Richard III, I Henry IV, Henry V, Romeo and Juliet, Julius Caesar, Antony and Cleopatra, Hamlet, King Lear, Macbeth, Othello.*

Prerequisite: English 200 or 210.

***Engl 348**—G. Zytaruk (10-0)

Restoration and Eighteenth Century Literature—Special study of representative works of Dryden, Swift, Pope, Addision, and Johnson, with additional reading in the drama, poetry, and prose of the period.

Prerequisite: English 200 or 210.

***Engl 364**—M. Legris (10-0)

Poetry of the Victorian Period—Selected works of Tennyson, Browning, Arnold, Clough, Fitzgerald, Rossetti, Morris, Meredith, F. Thompson, and Swinburne.

Prerequisite: English 200 or 210 or equivalent.

***Engl 380**—Elizabeth Bruce (10-0)

Early Twentieth Century—Representative plays by Shaw, Wilde, Glasworthy, Synge, O'Casey, Lawrence, T. S. Eliot, Auden. Representative novels by Bennett, Wills, Conrad, Forster, Lawrence, Joyce, Woolf, Huxley. Poetry, with particular attention to the work of Hopkins, Yeats, Eliot.

Prerequisite: English 200 or 210.

***Engl 383**—D. Killam (10-0)

American Literature from 1900—A selection of representative major writers from 1900 to the present.

Prerequisite: English 200 or 210.

Note: Not to be taken by students with credit in English 394.

Engl 398—L. Logie and Miriam Cox (10-0)

Children's Literature—A historical and critical study of literature written for children with attention to the interaction between children's literature and educational theory. The course will bring to the attention of prospective elementary teachers some of the world's resources in good books for children.

Prerequisite: English 200 or 210 or equivalent.

Notes:

1. This course is restricted to B.Ed. students in the Elementary Route.
2. This course may not be presented for degree credit in the Faculties of Arts and Science.

FRENCH

***Fren 200** (10-5)

First Year University French—This is an intensive course in spoken and written French. The course includes grammar, composition and literature.

Prerequisite: Grade XII French or French 100.

***Fren 330**—R. G. Motut and P. A. R. Monod (10-0)

French Language and Civilization—This course is especially designed to improve both the spoken and written language of students. It consists of literary selections from representative French authors, contrastive phonetics of French and English, oral work in class and intensive drill in the language laboratory.

Prerequisite: French 200 or 201.

Note: This course, designed for teachers and prospective teachers, will not overlap, or serve as a substitute for Education CI 258.

***Fren 350**—P. A. Robberecht (10-0)

Introduction to French Literature—The study of major literary works from Villon to Camus.

Prerequisite: French 330 or written consent of the Department of Romance Languages.

Note: Consent of department where required must be filed with registration forms.

***Fren 380**—Jeanne Devillers (10-0)

Prose and Poetry of the Late Nineteenth Century—A study of naturalism in the novel and of the Parnassian and Symbolist schools of poetry.

Prerequisite: French 350 or written consent of the Department of Romance Languages.

Note: Consent of department where required must be filed with registration forms.

***Fren 420** (10-0)

Introduction to French Canadian Literature.

Prerequisites: Two senior French courses.

GEOGRAPHY

***Geog 201** (10-8)

Physical Georgraphy—A systematic study of the origin, nature, and distribution of elements of the natural environment. Land forms, weather and climate, vegetation, soil, water, and mineral resources will be related to each other in place. The laboratory work will complement the lectures and will include interpretation, study, and preparation of maps and charts.
Note: Georgaphy 201 is classified as a natural science course.

***Geog 300** (10-0)

Human Geography—The significance of human distribution on the earth. Man's relation to the physical environment; world population problems; cultural patterns in the world; aspects of political and economic geography in selected world trouble areas; racial geography and urban geography. Students planning on taking this course are strongly urged to precede it by Geography 201.
Note: Geography 300 is classified as a social science course.

GERMAN

***Germ 200** (10-5)

First Year University German—This course is devoted to the development of the student's ability in speaking, reading and writing German, using modern short stories, cultural readers and audio-visual aids.
Prerequisite: German 30, German 100 or the equivalent.

***Germ 350-305** (10-5)

Survey of German Literature—A general survey, a study of selected periods and of major works in German literature.
Prerequisite: German 200 or written consent of the Department of Germanic Languages.
Note: Consent of department where required must be filed with registration forms.

HISTORY

***Hist 200**—G. A. Stelter (10-0)

European History—The history of Europe from the decline of the Roman Empire in the West to the present.

***Hist 306**—G. A. Rothrock (10-0)

Europe, 1648-1815—European history from the Treaties of Westphalia to the downfall of Napoleon.

***Hist 350**—W. B. D. Heeney (10-0)

British History—A survey of the history of the British Isles to 1914.

***Hist 370**—R. Hett and Associates (10-0)

Canada—A survey of the political and social history of Canada.

***Hist 466**—J. G. Rayback (10-0)

American History Since 1876.

HOUSEHOLD ECONOMICS

***HEc 210**—Marion Zarkadas (10-12)

Food and Nutrition—An elementary study of the composition and nutritive value of foods, with laboratory practice in food preparation, meal planning and service.

Notes:

1. Not more than one of Household Economics 210 or 350 may be taken for credit in the Faculties of Arts and Science.
2. HEc 210 is not open to students with credit in HEc 221 and/or 321.
3. HEc 210 will be offered for the last time in the 1966 Summer Session.

HEc 303 (5-6)

Household Management—Application of home management principles in use of time, energy and equipment. Selection, arrangement and care of materials and equipment used in the kitchen.

HEc 311—Sharon Dralle (5-0)

Consumer Textiles—Interpretation of basic textile information and other factors related to consumer selection, use and care of apparel and household textiles.

Prerequisite: HEc 202 or equivalent.

HEc 355 (formerly 453) (5-0)

Family Finance—Standards of living; family income, savings and expenditures; consumer economics and consumer education.

HEc 455 (5-0)

Family Living—A study of the family in contemporary society; factors influencing the development of relationships within the group.

HEc 462—Helen Moseson and Annette Ostapovitch (10-12)

Advanced Clothing—The study of historic and contemporary costume design. The development of the foundation pattern. Flat pattern designing for selected garments and construction in appropriate fabrics.

Prerequisite: HEc 202, or HEc 201 and 203.

Note: This course will be offered for the last time in the 1966 Summer Session.

LINGUISTICS

***Ling 305**—Thomas C. Correll (10-0)

Culture and Language—An inquiry into the nature of human communication, its cultural conditions and consequences. Special attention will be given to the interrelations of the linguistic structures and habitual modes of behaviour and thought of various societies.

Note: This course is the same as Anthropology 305.

***Ling 350**—W. F. Klatte (10-0)

General Linguistics—An introduction to the study of language in its structural and historical aspects. Examples will be drawn from modern European languages.

***Ling 370 (formerly 430)** (10-0)

Contrastive Linguistics: French and English—An analytical study of the French and English languages, comparing and contrasting their linguistic structure, i.e. phonetics, phonemics, morphology, syntactic patterns and lexicology. Practical work in oral recognition and phonetic transcription.

Prerequisites: French 200, and Linguistics 350 or French 330.

***Ling 387 (formerly English 387)**—G. C. Gilbert (10-0)

Linguistic Geography—An introduction to the principles of linguistic geography. Examples will be drawn largely from varieties of North American English.

***Ling 389 (formerly English 389)**—J. W. Gair (10-0)

Modern English Grammar—A survey of several approaches to the description of modern English grammar.

Prerequisite: English 200 or equivalent.

Note: Students who register in this course are strongly advised to register concurrently in Linguistics 350 if they do not already hold credit in that course.

***Ling 470**—M. Swadesh (10-0)

American Indian Linguistics—A survey of indigenous languages of North America, with special reference to those spoken in western Canada. A study of the distribution and structural characteristics of these languages, supplemented by laboratory work involving analysis of an American Indian language, using a native speaker as an informant.

Prerequisite: Linguistics 350.

***Ling 699**—G. C. Gilbert (10-0)

Conference Course—Studies in dialectology.

MATHEMATICS

***Math 201**—W. J. Bruce (10-0)

Introductory Calculus—Rates of change. Differentiation and integration of simple functions. Applications. Analytic geometry of the conic sections. Exponential, logarithmic and trigonometric functions.

Prerequisite: Mathematics 30 and 31 or their equivalents.

Notes:

1. Mathematics 201 may not be taken concurrently with another course.
2. Students requiring Mathematics 207 or 220 should now register in Mathematics 201 for equivalent credit.

Math 264—T. Fostvedt and G. Dalsin (10-0)

Foundations of Mathematics—Axiomatics. Sets and relations. Elementary logic. Classical and modern views of geometry. The number system. Systems of numeration and scales of notation. Measurement.

Prerequisite: Mathematics 30, or written permission of the Department of Mathematics. (*Continued next page.*)

Notes:

1. This course is restricted to students in the Faculty of Education. It should be of special interest to teachers who may find themselves called upon to teach the new mathematics program being introduced into the elementary schools.
2. This course cannot be applied on a major in mathematics.
3. Credit may not be obtained in both Mathematics 264 and Mathematics 274.
4. Permission of the department where required should be filed with registration forms.

***Math 274** (10-0)

Algebra and Geometry—Logic and sets. Axiomatic geometry. Projective geometry. Rotation of axes. Graphs of polynominal functions. Linear equations. Vectors, matrices and determinants. Mathematical systems (scales of notation). Mathematical induction. Binomial theorem. The axiomatic approach to the number system. General algebraic systems.

Prerequisite: Mathematics 30.

***Math 304** (10-8)

Calculus and Analytical Geometry—Determinants. Polar and parametric coordinates. Methods and applications of integration. Infinite series. Vectors and space geometry. Partial differentiation. Complex numbers. Multiple integrals. Elements of linear differential equations.

Prerequisite: Mathematics 201, 207 or 220.

***Math 424**—M. V. Subbarao (10-0)

Algebra and Number Theory—Fundamental Theorem of Arithmetic. Continued fractions. Linear congruences. Elementary theory of arithmetic functions. Sum of squares. Quadratic reciprocity. Groups, rings, integral domains, fields.

Prerequisite: Mathematics 270 or 271 or 274.

Notes:

1. This course is primarily for B.A. students. Other students admitted only with the consent of the Department of Mathematics.
2. This course is recommended for students who have taken the Mathematics 274-374 sequence, although Mathematics 374 is not a prerequisite.

MUSIC

Music 210—R. E. Stephens (10-10)

Foundations of Music—The development of a musical repertory and a knowledge of basic content appropriate for teachers.

Note: This course is open only to B.Ed. students lacking the prerequisite for Music 200 and cannot be used to replace Music 200 as the prerequisite for advanced courses in Music.

***Music 300**—A. B. Crighton (10-15)

History of Music and Instrumental Technique—A study of the history of music from the year 1600 to 1900. Scores and records of music are provided. A critical evaluation of the styles of various composers is emphasized. The laboratory consists of the study of brass and woodwind instruments as applied to band and orchestral groups.

Prerequisite: Music 200 or equivalent.

***Music 311**—A. A. Smith and Associates (10-10)

Band and Orchestra—Practical instruction in band instruments and in all matters relating to the formation, direction, and administration of the beginning band. **This is an intensive course intended only for persons already competent in theoretical and practical music.**

Instrumental studies will include tone production, fingering, and the embouchure of all brass and woodwind instruments. A survey of percussion instruments and their performance techniques. Care of band instruments. Conducting. A special study of clarinet, trumpet, trombone and rudimentary drumming.

Prerequisite: Written consent of the Department of Music.

Note: Consent of department must be filed with registration forms.

PHILOSOPHY

***Phil 240**—G. Price and Associates (10-0)

Introduction to Western Philosophy—This course is designed to introduce the student to the main problems and theories that have dominated philosophical thought in the Western world, through the study and discussion of selected philosophical classics. Emphasis will be placed both upon a sound acquaintance with the main outlines of our philosophical tradition and up the ability to handle philosophical ideas independently. To this end both lectures and discussions will form part of the student's training.

***Phil 242**—R. M. Montague, C.S.B. (10-0)

Foundation and Development of Christian Philosophy—A study of the ideas and main currents of Western Philosophy from its beginnings in the creative period of Greek thought, to achieve an appreciation of the historical roots of our civilization. Selected ideas and problems will be examined in the writings of significant contributor to this development. Lectures and discussions.

(This course is offered by St. Joseph's College and is accepted as an alternative to Philosophy 240.)

***Phil 352**—C. Williamson (10-0)

Social Philosophy—A philosophical and synoptic study of the nature of society.

PHYSICAL EDUCATION

Any student who proposes to enrol in a Physical Education Activity course in the Summer Session must present a certificate of medical fitness signed by his own physician. Registration will not be accepted unless accompanied by this medical certificate. Activity courses are indicated below by a dagger (†).

†PEd 202—Margaret Ellis (10-10)

Introduction to Elementary School Physical Education—A study of children at play. Movement education leading to the development of skill in various fields of physical activity.

†**PEd 332**—G. M. Fracas and H. McLachlin (10-10)

Principles of Physical Education (Secondary)—Analysis of factors derived from foundation sciences and philosophies as they affect activity selection and basic objectives at the secondary school level. Laboratory experiences include track and field, dance and gymnastics.

PEd 392—A. W. E. Eriksson (10-0)

Health Education in Secondary Schools—Personal and environmental school health with special emphasis on methods and materials in health instruction.

PEd 419—Audrey Carson (10-0) (1st 3 wks.)

Problems and Trends in Elementary School Health and Physical Education.

Prerequisites: PEd 202 and PEd 325.

†**PEd 421**—G. M. Elliott (5-10L)

Individual and Team Activities.

Prerequisite: PEd 202.

PEd 564—R. G. Glassford (10-0)

Directed Studies.

PEd 588—M. L. Howell (10-0)

Historical and Comparative Physical Education.

PHYSICAL SCIENCE

***PhSc 341** (10-0)

A course designed for B.A. and B.Ed. students to give them some appreciation of fundamental ideas and methods in the physical sciences, of modern trends in this field, and of its relation to other disciplines. Illustrative material will be taken from Physics, Chemistry, Astronomy and Geology, and the history and development of the subject will be stressed.

Notes:

1. This course may not be used for credit towards the B.Sc. degree.
2. This course is not open to first year students, and may not be taken for credit by students who have credit in Physics 100 or 200.

PHYSICS

***Phys 340** (10-12)

Light, Electricity and Magnetism—A course designed to follow Physics 240 and to give a foundation in physics suitable for work in other physical sciences. Interference, diffraction and polarization of light. Electrostatics, potential, capacitors, D.C. circuits, magnetism and magnetic field, electromagnetism, induced E.M.F., self-inductance, introduction to alternating currents. Elementary atomic and nuclear physics.

Prerequisites: Physics 240 and Mathematics 180 or 201 or 207.

Note: This course may not be taken concurrently with another course.

POLITICAL SCIENCE

***Pol S 200** (10-0)

Elements of Political Science—A study of the principles and practices of modern government, with emphasis on the democratic constitutional state. Among the topics studied are the nature and theory of the state; types of constitutions; the functions and composition of the legislature, executive and judiciary; representation; political parties and pressure groups.

***Pol S 331**—R. R. Gilsdorf (10-0)

Government of the United States—A study of the history and background of American political institutions. Emphasis will be placed on the development, significance and philosophy of the Constitution, and on parties, pressure groups and the working of congressional government.

***Pol S 463**—L. C. Green (10-0)

Developments in World Politics Since 1945—A survey of the major developments in world politics since 1945, with special emphasis on the foreign policies of the major powers.

Prerequisite: Political Science 200 or written consent of the Department of Political Science.

Note: Consent of department where required must be filed with registration forms.

PSYCHOLOGY

***Psycho 202**—W. A. Blanchard and E. Howarth (10-0)

Introduction to General Psychology—A survey of problems, methods and principles in various fields of psychology.

***Psycho 337**—H. Steinmetz (10-0) (1st 3 wks.)

Individual Differences—A survey of the biological and social conditions contributing to variations among individuals; methods for describing individuality.

Psycho 353 (5-0)

Developmental Psychology—A study of behaviour as it is related to normal development and aging.

***Psycho 383** (10-0) (2nd 3 wks.)

Personality—An introductory survey of the area of personality including a study of representative theoretical points of view and research relevant to the major problems in this area.

Prerequisite: Psychology 202 or equivalent.

***Psycho 489** (5-0)

Abnormal Psychology—A general introduction to abnormal psychology.

Prerequisite: Psychology 202 or equivalent and written consent of the Department of Psychology.

Note: Consent of department must be filed with registration forms.

SOCIOLOGY

***Soc 202**—K. R. Cunningham and Associates (10-0)

Introductory Sociology—An introductory analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society is analysed in terms of its structure, culture and social ranking schemes. The interrelationships between the various institutions (e.g. family, church, school, government) are considered. The processes are examined whereby the individual is socialized into society, as are the sources of comformist and non-conformist behavior.

***Soc 320** (10-0)

Social Problems—An analysis of deviant behavior (e.g. crime, juvenile delinquency, drug addiction) and an analysis of social disorganization including world population crisis, urban and rural problems, industrial and other problems.

***Soc 341-343**—P. M. George (10-0)

Social Psychology and Collective Behavior—An introduction to the study of individual and group behavior observed in social processes. Analysis of various forms of collective behavior including crowds, mobs, panics, audiences, fashions, fads, cults, etc.

Prerequisite: Sociology 202 or 402, or Psychology 202, or Educational Psychology 276.

Note: This course is not open to students with credit in Psychology 341.

***Soc 350**—C. A. S. Hynam (10-0)

Sociology of Community Development—A study of human communities; their institutional structure, ecological factors associated with patterns of growth, community relations, community planning.

Prerequisite: Sociology 202 or 402 or written consent of Department of Sociology.

Note: Consent of department where required must be filed with registration forms.

***Soc 362**—H. W. Lungstrass (10-0)

Sociology of Leisure—Sociological analysis of leisure; its relation to work, personality, family, religion, education, social class, community, government and mass media.

***Soc 402**—K. R. Cunningham and Associates (10-0)

Principles of Sociology—A course in basic principles of sociology for students with advanced standing.

Prerequisite: Senior or graduate standing.

Note: Not open to students with credit in Sociology 202 or the equivalent.

***Soc 454**—R. Thomlinson (10-0)

Sociology of the Metropolis—The study of the contemporary metropolis with special reference to its ecological, demographic, institutional and social psychological characteristics and their interrelationships.

Prerequisite: Sociology 202 or 402 or written consent of the Department of Sociology.

Note: Consent of department where required must be filed with registration forms.

***Soc 519**—J. C. Hackler (10S)

Selected Topics in Research Methodology.

STATISTICS

***Stat 255** (10-12)

Elementary Statistics—Graphs, tables, diagrams. Frequency distributions, averages, dispersion, moments. Elementary probability. Binomial, normal and Poisson distributions. Sampling. Regression and correlation. Significance tests. Applications to data in various fields.

Prerequisite: Mathematics 30.

Note: Statistics 255 may not be taken concurrently with another course.

UKRAINIAN

***Ukr 300**—T. Carlton (10-0)

Second Year Ukrainian—Thorough review of elementary Ukrainian grammar, advanced grammar, composition, and oral practice based on selected texts of classical Ukrainian literature.

Prerequisite: Ukrainian 100 or written consent of the Department of Slavonic Languages.

Note: Consent of department where required must be filed with registration forms.

***Ukr 360**—O. Starchuk (10-0)

Survey of the History of Ukrainian Literature since the Eighteenth Century—Historical survey of Ukrainian literature from Kotliarevsky to the present. Cultural background, literary works and major writers. Reading of selected texts, with composition based on short stories. Advanced elements of Ukrainian language.

Prerequisite: Ukrainian 300.

ZOOLOGY

Zool 300—C. Devillers (10-12)

The Chordates—A comparative review of the chordates, with dissections of available types from all classes.

Prerequisite: Biology 230 or written consent of the Department of Zoology.

Note: Consent of department where required must be filed with registration forms.

SUMMER SESSION 1966—EDMONTON

TIMETABLE

Schedule of Lecture Periods

8:00 a.m. to 10:00 a.m.

Art 200: Sect. 01
Art 240 (8:00-12:00)
Astronomy 253
*Biology 130
Classics 352
*Drama 270
Economics 200
Ed. Adm. 461
Ed. Adm. 560
Ed. Adm. 562
*Ed. Bus. 246
*Ed. Bus. 346
*Ed. Bus. 350
Ed. CI 286
Ed. CI 414
Ed. CI 422
Ed. CI 428
Ed. CI 432
Ed. CI 496 (8:00-12:00)
Ed. CI 538
Ed. Fdn. 492
Ed. IA 203 (9:05-10:00)
Ed. Psy. 308
*Ed. Psy. 508
English 314
English 380
English 398
French 330
French 420
*Geography 201
History 350
Linguistics 350
Linguistics 470
Mathematics 264
Mathematics 274
Philosophy 240
Philosophy 242
*Phys. Ed. 202
Phys. Ed. 392
Phys. Ed. 421
Phys. Ed. 564
Political Science 331
Psych. 337—1st 3 wks.
Psych. 383—2nd 3 wks.
Sociology 202
Sociology 320
Sociology 350
Sociology 402
Ukrainian 300

10:15 a.m. to 12:15 p.m.

Anthropolgy 202
Anthropology 305
Art 400
*Biology 230
Business Law 310
*Chemistry 230
Classics 358
Comp. Science 310
Drama 400
Economics 390
Ed. Adm. 526
Ed. Adm. 564
Ed. Bus. 345
Ed. CI 227 (10:15-11:10)
Ed. CI 231 (11:20-12:15)
Ed. CI 340
Ed. CI 346
Ed. CI 410
Ed. CI 420
Ed. CI 438
Ed. CI 460
Ed. CI 580
*Ed. IA 260
*Ed. IA 270
Ed. IA 589 (10:15-11:10)
Ed. IA 591 (11:20-12:15)
Ed. Psy. 476
Ed. Psy. 478
Ed. Voc. 589 (10:15-11:10)
Ed. Voc. 591 (11:20-12:15)
English 200
English 210
English 364
English 383
French 380
History 200
History 306
History 466
*H.Ec. 210
*H.Ec. 303 (10:15-11:10)
H.Ec. 311 (11:20-12:15)
H.Ec. 355 (11:20-12:15)
H.Ec. 455 ((10:15-11:10)
*H.Ec. 462
Linguistics 305
Linguistics 387
*Mathematics 201
*Mathematics 304
Philosophy 352
*Phys. Ed. 332
Phys. Ed. 419—1st 3 wks.
Phys. Ed. 588
*Physics 340
Political Science 463
Psych. 353 (10:15-11:10)
Psych. 489 (11:20-12:15)
Sociology 341-343
Sociology 454
*Statistics 255
Ukrainian 360
*Zoology 300

1:30 p.m. to 3:30 p.m.

*Accounting 200
Anthropology 420
Art 200: Sect. 02
Art 230 (1:30-5:30)
Classics 354
Drama 240
*Drama 480
Economics 310
Ed. Adm. 566
Ed. CI 209—1st 3 wks.
Ed. CI 341-343
**Ed. CI 361: Sec. 01
Ed. CI 406
Ed. CI 436
*Ed. CI 446
Ed. CI 456
Ed. CI 476
Ed. Fdn. 414
Ed. Fdn. 581-583
Ed. IA 370 (1:30-5:30)
Ed. Psy. 276
*Ed. Psy. 354
*Ed. Psy. 458
*Ed. Psy. 502
Ed. Psy. 570
English 288
English 332
English 348
*French 200
French 350
Geography 300
*German 200
German 350
History 370
Linguistics 370
Linguistics 389
Linguistics 699
Mathematics 424
*Music 210
*Music 300
*Music 311
Physical Science 341
Political Science 200
Psych. 202
Sociology 362
Sociology 519

*Consult also the Schedule of Laboratory periods on the next page.
**A second section of this course, Ed. CI 361, Sect. 02, will be available at 3:45 p.m.

Schedule of Laboratory Periods

Accounting 200—3:30-5:30 p.m., MTWTh.
Biology 130—1:30-4:30 p.m., MTWTh.
Biology 230—1:30-4:30 p.m., MTWTh.
Chemistry 230—1:30-4:30 p.m., MTWTh.
Drama 270—10:15 a.m.-12:15 p.m., daily.
Drama 480—3:30-5:30 p.m., daily.
Ed. Bus. 246—10:15 a.m.-12:15 p.m., daily.
Ed. Bus. 346—10:15 a.m.-12:15 p.m., daily.
Ed. Bus. 350—1:30-3:30 p.m., daily.
Ed. CI 446—3:30-4:30 p.m., daily.
Ed. IA 260—1:30-5:30 p.m., daily.
Ed. IA 270—1:30-5:30 p.m., daily.
Ed. Psy. 354—5 hours per week to be arranged.
Ed. Psy. 458—5 hours per week to be arranged.
Ed. Psy. 502—3:30-4:30 p.m., daily.
Ed. Psy. 508—10:15-11:15 a.m., daily.
French 200—3:45-4:45 p.m., daily.
Geography 201—1:30-3:30 p.m., MTWTh.
German 200—3:45-4:45 p.m., daily.
Household Economics 210—1:30-4:30 p.m., MTWTh.
Household Economics 303—1:30-4:30 p.m., MTh.
Household Economics 462—1:30-4:30 p.m., MTWTh.
Mathematics 201—1:30-3:30 p.m., daily.
Mathematics 304—1:30-3:30 p.m., daily.
Music 210: Choral and Instrumental—3:30-4:30 p.m., daily.
Listening—5 hours per week to be arranged.
Music 300: Instrumental—3:30-5:30 p.m., daily.
Listening—5 hours per week to be arranged.
Music 311—3:30-5:30 p.m., daily.
Physical Education 202—10:15 a.m.-12:15 p.m., daily.
Physical Education 332—1:30-3:30 p.m., daily.
Physics 340—1:30-4:30 p.m., MTWTh.
Statistics 255—1:30-4:30 p.m., MTWTh.
Zoology 300—1:30-4:30 p.m., MTWTh.

ACADEMIC STAFF

ADASKIN, G., Dip. V.S.A., Instructor in Drawing and Painting, Alberta College of Art, Calgary.

AFFLECK, Muriel A., B.Ed., M.Ed., Associate Professor of Elementary Education.

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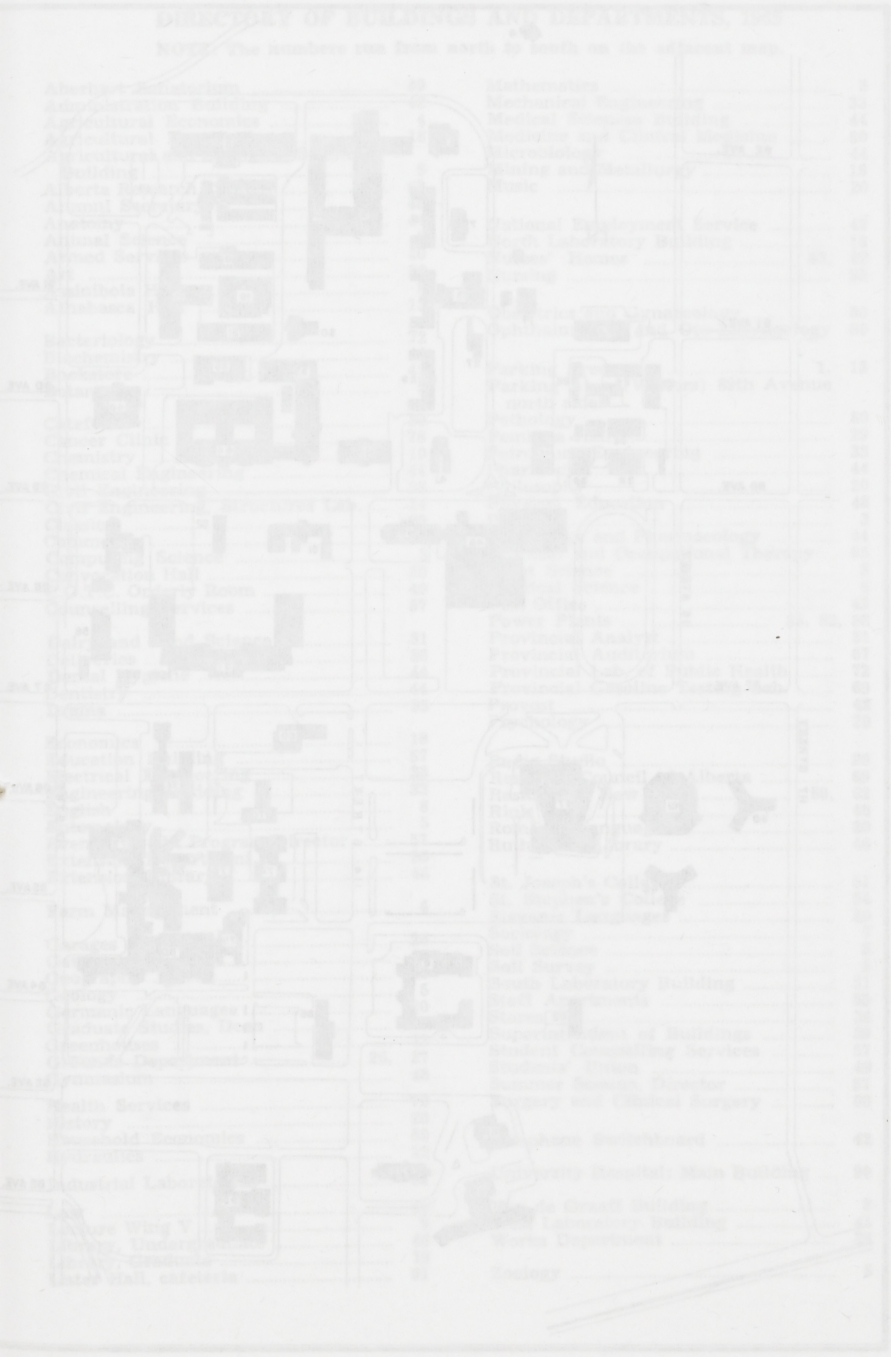
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ZARKADAS, Marion, B.Sc.(H.Ec.), Lecturer in Household Economics.

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ZYTARUK, G., B.Ed., B.A., M.A., Ph.D., Assistant Professor of English.



MAP OF EDMONTON CAMPUS



UNIVERSITY OF ALBERTA

DIRECTORY OF BUILDINGS AND DEPARTMENTS, 1965

NOTE: The numbers run from north to south on the adjacent map.

Aberhart Sanatorium 89
Administration Building 42
Agricultural Economics 4
Agricultural Engineering 18
Agricultural and Biological Sciences Building 5
Alberta Research Council 69
Alumni Secretary 49
Anatomy 44
Animal Science 5
Armed Services 40
Art 20
Assiniboia Hall 8
Athabasca Hall 13

Bacteriology 72
Biochemistry 44
Bookstore 42
Botany 5

Cafeteria 30
Cancer Clinic 78
Chemistry 10
Chemical Engineering 44
Civil Engineering 33
Civil Engineering, Structures Lab. 14
Classics 20
Commerce 52
Computing Science 3
Convocation Hall 20
C.O.T.C. Orderly Room 40
Counselling Services 57

Dairy and Food Science 31
Deliveries 36
Dental Hygiene 44
Dentistry 44
Drama 95

Economics 18
Education Building 57
Electrical Engineering 33
Engineering Building 33
English 8
Entomology 5
Evening Credit Program Director 57
Extension Department 95
Extension Library 46

Farm Management 4

Garages 24
Gateway Office 49
Geography 20
Geology 5
Germanic Languages 20
Graduate Studies, Dean 42
Greenhouses 12
Grounds Department 26, 27
Gymnasium 48

Health Services 70
History 20
Household Economics 58
Hydraulics 22

Industrial Laboratories 31

Law 46
Lecture Wing V 9
Library, Undergraduate 46
Library, Graduate 19
Lister Hall, cafeteria 61

Mathematics 3
Mechanical Engineering 33
Medical Sciences Building 44
Medicine and Clinical Medicine 80
Microbiology 44
Mining and Metallurgy 18
Music 20

National Employment Service 42
North Laboratory Building 18
Nurses' Homes 83, 92
Nursing 95

Obstetrics and Gynaecology 80
Ophthalmology and Oto-Laryngology 80

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Pathology 80
Pembina Hall 29
Petroleum Engineering 33
Pharmacy 44
Philosophy 20
Physical Education 48
Physics 3
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Physical and Occupational Therapy 95
Plant Science 5
Political Science 8
Post Office 42
Power Plants 35, 82, 88
Provincial Analyst 31
Provincial Auditorium 67
Provincial Lab. of Public Health 72
Provincial Gasoline Testing Lab. 69
Provost 42
Psychology 20

Radio Studio 20
Research Council of Alberta 69
Residences, New 60, 62
Rink 48
Romance Languages 20
Rutherford Library 46

St. Joseph's College 51
St. Stephen's College 54
Slavonic Languages 20
Sociology 7
Soil Science 5
Soil Survey 5
South Laboratory Building 31
Staff Apartments 59
Stores 36
Superintendent of Buildings 39
Student Counselling Services 57
Students' Union 49
Summer Session, Director 57
Surgery and Clinical Surgery 80

Telephone Switchboard 42

University Hospital: Main Building 80

Van de Graaff Building 2
West Laboratory Building 41
Works Department 38

Zoology 5

SUMMER SESSION, 1966

To: The Registrar
University of Alberta, Edmonton

The Dean of the Faculty of .....

approves the following courses taken by .....

at the University of Alberta at Edmonton, Summer Session, 1966, for credit at the University of Alberta at Calgary:

.....

.....

Date .....

.....
Dean

NOTE: UAC students proposing to take courses at Edmonton should complete and attach this form to their registration forms.

TEXTBOOK ORDER FORM

Summer Session, 1966

From .....

Address .....

.....

To: University Bookstore, Edmonton, Alberta.

Please forward the following books, C.O.D.

Students who attend the Summer Session at Calgary must order textbooks from the Bookstore there.

Course	Textbook(s)

Do not send payment with orders.

Office Directory

	Building	Telephone
University of Alberta (PBX)		439-8721
Summer Session	Education	752
Faculties and Schools		
Arts	Arts	711
Science	Math-Physics	735
Education	Education	759
Graduate Studies	Administration	499
Bus. Adm. and Com.	Commerce	439-6301
Physical Education	Physical Education	365
Household Economics	Household Economics	824
Registrar's Office	Administration	480
Student Counselling	Education	772
Dean of Women	Administration	216
Dean of Men	Administration	483
Infirmary	Health Services	439-4991
Housing	Lister Hall	439-4921

A directory of University buildings and departments will be found on page 67 of this Calendar.



evening credit program

1966-1967

UNIVERSITY OF ALBERTA - EDMONTON



Calendar

of the

Evening Credit Program

1966-67



University of Alberta, Edmonton

Important Information

COMMUNICATIONS

Mail should be addressed to the appropriate officer at the University of Alberta, Edmonton, Alberta.

Dr. W. H. Johns, *President*

Dr. M. Wyman, *Vice-President (Academic)*

Dr. J. W. Gilles, *Director, Evening Credit Program*

Dr. D. E. Smith, *Dean, Faculty of Arts*

Dr. D. M. Ross, *Dean, Faculty of Science*

Dr. H. T. Coutts, *Dean, Faculty of Education*

Dr. A. G. McCalla, *Dean, Faculty of Graduate Studies*

Dr. H. W. Harries, *Dean, Faculty of Business Administration and Commerce*

Mr. A. D. Cairns, *Registrar*
Admissions, Registration, Examinations, Records, Transcripts, Convocation.

Mr. A. J. B. Hough, *Director, Student Counselling*
Change of Faculty, Interest and Aptitude Tests, Personal Problems, Unsatisfactory Standing, Vocational Planning, Withdrawals from University.

Mr. J. M. Whidden, *Bursar*
Payment of Fees.

OFFICE HOURS

Monday through Friday
8:30 a.m. to 12:00 noon and 1:00 p.m. to 4:30 p.m., all year.

Saturday
Mid-September to mid-May: Reduced services 8:30 a.m. to 12:00 noon.
Interviews by appointment only.

Closed the remaining four months.

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ACADEMIC SCHEDULE

Evening Credit Program, 1966-67

With respect to the Evening Credit Program this schedule takes precedence over schedules appearing in other calendars.

1966

July—

Friday, 15—
Last day for receiving applications for undergraduate admission from outside Canada.

August—

Monday, 1—
Last day for receiving applications for undergraduate admission from Canadian Students. This requirement also applies to students who transfer from the University of Calgary.

Tuesday 9—
Last day for receiving applications for regular supplementals.

Monday, 29—
Supplemental examinations begin.

Wednesday 31—
Last day for receiving formal applications for admission to the Faculty of Graduate Studies.
Last day for receiving registrations in the Evening Credit Program (including those of students in the Faculty of Graduate Studies). Applications for admission from new students must have been received by the deadlines referred to above.

September—

Monday, 12 to Friday, 16—
Last week for securing departmental approval of Graduate Program forms.

Saturday, 24—
Special supplemental examinations.

Monday, 26—
Evening Credit Program classes begin at Edmonton, Smoky Lake and Vegreville

Tuesday, 27—
Classes begin at Camrose and Westlock.

Wednesday, 28—
Classes begin at Red Deer and Ponoka.

Thursday, 29—
Classes begin at Evansburg and Viking.

October—

Saturday, 1—
Classes begin at Grande Prairie.

Monday, 10—
Thanksgiving Day. Classes will not meet.

Monday, 17—
Last day for payment of undergraduate fees without penalty.

November—

Monday, 7 to Saturday, 12—
Test Week. Evening Credit Program classes will meet as usual.

Friday, 11—
Remembrance Day. Classes will not meet.

Saturday, 19—
Fall Convocation.

December—

Saturday, 17—
Last day of lectures before Christmas vacation.

1967

January—

Tuesday, 3—
First term lectures resume.

Monday, 9 to Saturday, 14—
Mid-session examinations. Evening Credit Program classes, except those in half-year courses, will meet as usual.

Monday, 16—
Lectures in second term half-year courses commence.

February—

Friday, 3—
Last day for application for graduate degrees and degrees in Arts, Commerce, Education, Pharmacy and Science to be conferred at Spring Convocation.

March—

Thursday, 23 to Sunday 26—
Second term recess. Evening Credit Program classes will not meet.

Monday, 27—
Last day for receiving applications for supplemental examinations to be written in April or May.

April—

Saturday, 15—
Last day of lectures in the Evening Credit Program.

Tuesday, 18—
Final examinations begin.

May—

Monday, 1—
Last day for registration of students in Summer Session.

Wednesday, 10—
Notice of intention to be absent from Convocation must be given by 12:00 noon.

Tuesday, 30—
Convocation (Part I) for the conferring of degrees and diplomas.

Wednesday, 31—
Convocation (Part II) for the conferring of degrees and diplomas.

GENERAL INFORMATION

Through its Evening Credit Program, the University of Alberta at Edmonton offers credit courses as various centres in northern Alberta. The purpose of this program is to enable persons employed during the day either to commence or to continue their university studies. The courses provided are selected primarily to meet the needs of students working towards the following degrees: B.Ed., B.A., B.Com. (first two years only).

A student proceeding towards a first degree normally will be required to attend at least one academic year as a full-time student.

The University reserves the right to impose registration quotas or to withdraw any of the courses proposed for the 1966-67 Evening Credit Program. For this reason, it is important that students register as early as possible. The deadline for registration is August 31.

CENTRES, COURSES AND TIMETABLES

EDMONTON

A — Arts Building
C — Chemistry Building
E — Education Building
MP — Mathematics-Physics Building
T — Tory Building
V — Lecture Wing, MP and C

Monday and Thursday, 6:30-7:45 p.m. (except as noted)

Anthropology 415	T 28
Art 230: Section 01 (6:30-9:00)	A 448
Section 02 (6:30-9:00)	A 303
Art 240 (6:30-9:30)	A 334
Business 202	E 128
*Chemistry 350 (Lecture)	V 102
Computing Science 310	V 103
Economics 350	T 119
Education CI 346	E 327
Educaton CI 426	E 176
Educational Foundations 492: Section 01	E 106
Section 02	E 107
Educational Psychology 508	E 76
Educational Psychology 510	E 122
English 392	A 139
English 398	A 236
French 330	A 143
History 370	T 38
Mathematics 374	MP 138
Philosophy 240: Section 01	T 90
Section 02	T 96
Political Science 370	T 129
Sociology 370	T 13

*Laboratory: Wednesday, 6:30-9:30 p.m.

Tuesday and Friday, 6:30-7:45 p.m. (except as noted)

Business 308 (6:30-9:30)—2nd term	E 116
Economics 200	T 119
Education CI 361—1st term	E 228
Education CI 363—2nd term	E 228
Education CI 480	E 359
Educational Psychology 476: Section 01	E 107
Section 02	E 107
English 200: Section 01	T 105
Section 02	T 108
English 210: Section 01	A 236
Section 02	A 135
English 383	A 148
*Geography 201 (Lecture)	T 125
Geography 300	T 103
Linguistics 389	A 139
Mathematics 243 (6:30-9:00)—1st term	MP 132
Mathematics 274	MP 146
Mathematics 360	MP 138
Psychology 202	A 143
Psychology 353—1st term	A 111
Psychology 383—2nd term	A 111
Sociology 202	T 10
Sociology 341—1st term	T 13
Sociology 343—2nd term	T 13

*Laboratory: Tuesday, 8:00-10:00 p.m.

CAMROSE

Educational Foundations 492—Tuesday, 6:30-9:30 p.m. Camrose Lutheran Junior College.

Note: The Camrose Lutheran Junior College will offer Economics 200 and History 200 as evening courses. Students interested in these courses will register with the College, not the University. For further information contact the Dean of the Junior College.

EVANSBURG

English 210—Thursday, 6:30-9:30 p.m. Evansburg High School.

GRANDE PRAIRIE

Educational Foundations 496—Saturday, 9:00 a.m.-12:00 noon. Montrose Junior High School.

PONOKA

History 370—Wednesday, 6:30-9:30 p.m. Ponoka Composite High School.

RED DEER

All classes meet Wednesday, 6:30-9:30 p.m.

Education CI 361 and 363
Educational Psychology 310
History 307
Philosophy 240
} Vocational High School

SMOKY LAKE

History 370—Monday, 6:30-9:30 p.m. Harry Kostash School.

VEGREVILLE

Economics 305—Monday, 6:30-9:30 p.m. Peter Svarich High School.

VIKING

Sociology 202—Thursday, 6:30-9:30 p.m. Viking High School.

WESTLOCK

Educational Psychology 478—Tuesday, 6:30-9:30 p.m. Westlock High School.

CLASSIFICATION OF STUDENTS

Students are classified as graduates, undergraduates, specials and auditors.

Graduate Students are admitted to the Faculty of Graduate Studies in one of the following categories:

1. **Candidate for a master's degree.**
2. **Provisional candidate for a doctor's degree.** All Ph.D. and Ed.D. candidates are classified as provisional candidates until they have passed their Candidacy Examinations.
3. **Probationary graduate student.** One whose university record is either: (a) difficult to assess (e.g. some foreign students) or (b) below the standard normally required.
4. **Conditional graduate student.** One who is required to take undergraduate courses prerequisite to, and in addition to, the graduate program. Fees for such courses are not included in graduate program fees.
5. **Special graduate student.** One who wishes to take graduate courses for purposes other than degree credit at this university.

Undergraduate Students are those who possess full senior matriculation and who are taking one or more courses for credit towards an undergraduate degree.

Special Students are those who, although registered in one or more courses, are currently neither seeking credit towards a degree or diploma granted by this university, nor entrance into a graduate program.

Auditors are students who have been granted official permission to attend lectures in a course on the understanding that they may not participate in class discussion, assignments or examinations. The audit privilege is restricted to a student who is currently registered in a degree or diploma program, and who secures written permission from the instructor in the course, endorsed by the student's Dean or Director, to register in the course as an auditor.

MATRICULATION REQUIREMENTS

General requirements

Matriculants from the high schools of Alberta seeking admission to the University must possess—

(a) a high school graduation diploma with

(b) "B" (50%) or higher standing in the required courses of Grade XII as set forth in the prescriptions of the various faculties and schools, and

(c) an average in these courses of at least 60.0%.

Notes:

1. A student from another Province in Canada who has obtained clear senior matriculation for the University or Universities of that Province will be admitted to the University of Alberta with clear matriculation subject to the requirements for the first year courses in each program. Students who do not have clear matriculation on this basis will be required to complete full Alberta matriculation of the Faculty to which admission is sought.
2. The requirement of a high school diploma may be waived for adult students.
3. These general requirements notwithstanding, the University may at its discretion refuse admission to any applicant. For example, this regulation normally will be applied in cases where applicants have written an inordinate number of examinations in order to attain the nominal entrance requirements.

Faculty of Arts

For B.A., B.Mus., and B.F.A. Programs—The general requirements with credit in:

1. English 30;
2. Social Studies 30;
3. Mathematics 30;
4. A language other than English (see below);
5. Physics 30 or Chemistry 30 or Biology 30 or 32*;
6. A second language (item 4) or a second science (item 5).

Notes:

1. The matriculation language other than English normally will be one of the languages taught in Alberta High Schools, i.e., French 30, Latin 30, or German 30. However, the Faculty will accept Greek, Italian, Russian or Spanish at an equivalent level.
2. If a second matriculation language is presented, it may be any of the languages mentioned in the preceding paragraph, or any other language (at an equivalent level) provided it is not from the same linguistic group as the first matriculation language. Students wishing to present a language not mentioned above should submit to the Dean's office evidence of their attainment in that language.

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*Credit in Biology 32 will be accepted provided it was obtained prior to September 1, 1965.

3. Candidates for the Bachelor of Music must present Grade VII practical and Grades IV and V theoretical of the Western Board of Music.

Faculty of Science

For a B.Sc. Program—The general requirements with credit in:

1. English 30;
2. Social Studies 30;
3. Mathematics 30;
4. *One* of: French 30, German 30, Latin 30, or another language at an equivalent level,
5. and 6. *Two* of: Chemistry 30, Physics 30, Biology 30 or 32*.

Faculty of Business Administration and Commerce

For a B.Com. Program—The general requirements with credit in:

1. English 30;
2. Social Studies 30;
3. Mathematics 30;
4, 5, and 6. *Three* of: Chemistry 30, Physics 30, Biology 30 or 32,* French 30 or German 30 or Latin 30, or another language at an equivalent level.

Faculty of Education

For a B.Ed. Program—The general requirements with credit in:

1. English 30;
2. Social Studies 30;
3, 4, 5, 6. *Four* of: French 30, German 30, Latin 30, Chemistry 30, Physics 30, Biology 30 or 32,* Mathematics 30, Mathematics 31, Music 30.

Notes:

1. Candidates intending to major in biological sciences or household economics should present Chemistry 30 or equivalent.
2. Candidates intending to major in physical sciences should present Chemistry 30, Physics 30, and Mathematics 30 or equivalents.
3. Candidates intending to major in mathematics should present Mathematics 31 in addition to Mathematics 30.
4. Mathematics 31 will be accepted only on the basis of a Grade XII Departmental examination.

Other Faculties

Students interested in the matriculation requirements of other faculties and schools of the University should address a request for the appropriate calendar to the Registrar.

ADMISSION PROCEDURES

Application Forms

Prospective students who have not previously attended the University of Alberta at Edmonton must secure and complete Application for Admission forms

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*Credit in Biology 32 will be accepted provided it was obtained prior to September 1, 1965.

and must submit them to the appropriate office by the prescribed deadline. Applicants for admission to the Faculty of Graduate Studies must obtain forms from the Dean of that Faculty. Applicants for admission to undergraduate programs or as special students may obtain them from the Registrar of the University at Edmonton.

Deadlines

Applications for admission to undergraduate programs ..... August 1
Applications for admission to Graduate Studies ..... August 31

Transcripts

Every applicant should arrange, prior to the deadline, for the Registrar of the University (or the Dean of Graduate Studies if he is applying for entrance to that Faculty) to receive an official transcript of his high school education and one transcript (two transcripts for Graduate Studies) of any courses taken at another university or college, to be sent directly from the Department of Education or other institution maintaining such records.

Advanced Standing

Students from other universities may be admitted to advanced standing except in the combined courses. Extramural credits from recognized universities may be accepted under certain conditions, but such credits will not be considered beyond the first year of university work. Students who have taken the equivalent of university courses in some other manner may be excused such courses but will not be granted advanced standing in them. They will be required to substitute other courses in order to complete a program of normal weight at this university.

All applications for such admission should be addressed to the Registrar well in advance of the beginning of the session. Each application will be dealt with on its merits. The University reserves the right to require applicants for advanced standing to write examinations at any level including that of matriculation.

The amount of advanced standing that may be granted is limited by the residence requirements of the University of Alberta.

Visé Fees

A fee of $5.00 is charged for the evaluation of educational documents issued in Canada but outside Alberta; the fee is $10.00 for documents issued in other countries. Students entering the Faculty of Graduate Studies are exempt from visé fees.

REGISTRATION PROCEDURES

A student is responsible for the completeness and accuracy of his registration. He is also responsible for any adjustments of registration made necessary by the results of supplemental examinations. Particular care should be exercised with regard to prerequisite courses. Registration in courses which directly conflict on the time table will be allowed only when the permission of the Faculty Council concerned has been secured.

Limitations on Registration

1. No student may offer for credit in any period of twelve consecutive months more than three courses by a combination of Summer Session,

Evening Credit Program or late afternoon classes, and extramural study.

2. In the Faculties of Arts and Science no student, except by special permission of the Council of the Faculty, may offer for credit in any period of twelve consecutive months commencing September 1 more than five courses.

Advance Registration

Registration forms must be completed and returned in duplicate to the Registrar of the University at Edmonton **not later than August 31.** These forms must be accompanied by a non-refundable registration fee of $10.00 in the case of graduate students, or by a non-refundable deposit on tuition fees of $10.00 in the case of undergraduates. Cheques and money orders must be made payable to the University of Alberta.

Students whose registrations are approved will receive from the Registrar class admission cards and a statement of fees.

Confirmation of Registration

Students must confirm their advance registration by handing in their class admission cards to their instructors at the first class session they attend.

Change or Cancellation of Registration

After confirming his registration, a student may not change from one course to another, abandon a course, or withdraw from the Evening Credit Program without first obtaining permission from the Dean or Director of his faculty or school. This permission, in the form of a "Change of Registration" or "Withdrawal" slip, signed by the Dean or Director, must be presented to the Registrar before the change becomes official.

A student who abandons a course or withdraws from the Evening Credit Program without completing the required forms will not be eligible for any refund of fees, nor for exemption from fees in the event that he has not paid them.

Payment of Fees

Upon payment of fees students will receive an identification card. Registration is incomplete until fees have been paid and is subject to cancellation unless payment has been made by the final date mentioned in the following regulations.

1. Instruction fees paid for Evening Credit courses will not be credited towards instruction fees for daytime courses except in the cases of students registered in the Faculty of Graduate Studies.
2. Fees should be remitted by cheque or money order payable at par to the University of Alberta—not to any officer of the University.
3. Fees are payable at the time of advance registration. If, for any reason, payment is deferred until after receipt of a fee assessment, fees together with the fee assessment card should be sent direct to the Bursar, University of Alberta at Edmonton.
4. The last date for the payment of fees by undergraduate students is October 17. A penalty fee of $5.00 will be charged on any payment made or postmarked subsequent to that date and must be added to any

remittance mailed or delivered to the University. If payment in full has not been made by October 31, registration will be subject to cancellation and the student to exclusion from classes. **There is no provision for partial payments.**

5. The last date for the payment of fees by graduate students is October 17 or fifteen days after the date of assessment, whichever is the later. A penalty of $5.00 will be charged on any payments made or postmarked subsequent to that date. There is no provision for partial payments.
6. In case of non-attendance all fees paid, except the registration fee or the $10.00 deposit on tuition fees, will be refunded upon application to the Registrar.
7. If, after confirmation of registration, notice of withdrawal or cancellation of registration is received by the Registrar by November 30, all fees except the registration fee or the $10.00 deposit on tuition fees, will be returned. If notice is received subsequent to November 30, a *pro rata* charge from October 17 will be made and the balance refunded except no refunds will be made where withdrawal or cancellation is subsequent to March 31.

FEE SCHEDULE

(Fees are subject to change without prior notice)

Undergraduate Programs

Instruction Fee: Per full-year course	$100.00
Per half-year course	50.00
Auditor's Fee: Per full-year course	12.00
Per half-year course	6.00

Graduate Programs

Registration fee, per student	$ 10.00

Instruction fee: Part-time students will be assessed $100.00 per course up to amount of the total instruction fee prescribed for the full program. Part-time students will be subject to an extra assessment of $40.00 for each registration in excess of three. Any outstanding balance will be assessed in the student's final session.

TEXTBOOKS

Students should obtain their textbooks from the University Bookstore at Edmonton. Mail orders will be acepted only on a C.O.D. basis.

ATTENDANCE

1. Regular attendance is expected of students in all courses. Students having an inordinate number of unexcused absences from a course may be refused permission to take the final examination.
2. Absences are counted from the first day of the session.
3. Students who are late for a lecture or laboratory period will be marked absent unless at the end of the period in question they account satisfactorily to the instructor for their lateness.
4. Illness and Physical Disability:

(a) Students who are absent from two or more consecutive classes in a course because of illness or disability should report the reason to the instructor upon their return.

(b) Absence from term or final examinations. See paragraphs 5 and 6 of the next section (Examinations).

5. Students who are absent from two or more consecutive classes in a course for some valid reason other than illness should report to the instructor upon their return. If the instructor requires an absence slip, it will be the student's responsibility to have one signed by the Registrar, and show it to the instructor.

6. Students desiring leave of absence in a given course must apply to the Registrar. At the end of such period of absence, the student must present an absence slip for the Registrar's signature.

EXAMINATIONS

1. **Final Examinations.** In courses completed in the first term, final examinations may be held either during the test week in January under departmental supervision, or at the end of the session, at the discretion of the departments concerned. All other final examinations are held at the end of the session.

   Students in the Evening Credit Program normally will write the same final examination as students in the regular session and at the same time. However, at the discretion of the departments concerned separate final examinations may be approved.

2. **Distribution of Credits.** In each course where a final examination is held, credit of not less than 30% nor more than 70% will be assigned to term work. The remaining credit in each course will be assigned to the final examination.

3. **Grading System.** In the Winter Session of 1966-67 a new nine-point grading system will be introduced, as follows:

9	
8	Excellent
7	
6	Good
5	
4	Pass
3	
2	Fail
1	

4. **Passing Grades.** For students proceeding towards an undergraduate degree the minimum passing grade is 4 unless otherwise specified; in courses taken towards a graduate degree the minimum passing grade is 6

5. **Debarment from Final Examination.** A student may be refused permission to write a final examination in a course on the recommendation of the de-

partment concerned and with the concurrence of the dean of his faculty in the following circumstances:

(a) The student has an inordinate number of unexcused absences.
(b) The student has neglected to do a substantial proportion of his written assignments in a course of which these are an essential feature.
(c) The student has neglected to do a substantial portion of the laboratory work in a science course.

6. **Absence from Term Examinations or Tests.** If a student has an unexcused absence from a term examination or test, the mark assigned to him will be zero. However, in case of illness the student may be excused from writing the examination or test. In applying for exemption a student must present to his instructor an absence slip signed by a physician. When exemption is granted the percentage allotted to the examination or test missed will be added to the percentage allotted to the final examination.

7. **Absence from Final Examinations.** Any student who is ill or suffering from severe domestic affliction is advised not to sit for a final examination. Instead he should advise the Registrar at once of the circumstances and should apply for a deferred final examination to be written at the time of the regular supplementals. Similar action should be taken by a student who, because of religious convictions or for other cogent reasons, is unable to write a final examination at the scheduled time. Such application will be referred to the student's dean or director for a final decision.

   If a student becomes ill or receives word of domestic affliction during the course of an examination, he should report at once to the Supervisor, hand in his unfinished paper and request that it be cancelled. Thereafter, if illness is the cause, he must report promptly to a physician so that any subsequent application for a deferred examination may be supported by a medical certificate. The Registrar should be notified of the circumstances in writing within forty-eight hours of the examination.

   Should a student write an examination, hand in his paper for marking, and later report extenuating circumstances to support his request for cancellation of his paper and for another examination, such request will not be entertained.

8. **Statement of Record.** After each University session a statement of record is mailed to each student at the home address specified on his registration form. This should not be expected before June 15.

9. **Reappraisal of Final Examination Papers.** Since great care is taken in the marking of final examinaton papers, a student should apply for reappraisal of a paper only if he has good reason to believe that a mistake has been made. Reappraisals are dealt with by the head of the department in consultation with members of the staff. A request for reappraisal must be made by letter to the Registrar within thirty days after the publication of results, accompanied by a fee of $10.00 for each paper. The fee will be refunded if the grade is raised. It should be understood that if the grade is changed, the new grade, whether higher or lower than the original, replaces it as the student's official grade in the course.

   The reappraisal privilege is limited to two papers. Normally there is no such privilege for supplemental examinations.

Students awaiting the outcome of a reappraisal should make application for supplemental examinations by the prescribed deadline.

10. **Supplemental Examinations.** Supplemental examinations are conducted by the University in September of each year. A student granted the privilege of writing supplemental examinations must do so at the time of regular supplemental examinations next following or, if given special permission by the Dean, write the regular examinations next following. A student who has failed in a course in the preceding session and who has been granted a supplemental examination should apply to the Registrar not later than August 9, remitting the prescribed fee. The privilege of writing supplemental examinations may be withheld by the Faculty Council if the student's grade-point average, including the course or courses failed, is below that required for promotion. Any student who returns to the University, having failed a supplemental examination or having neglected to write it, will be required to repeat the course. In certain cases an equivalent course may be prescribed instead of the failed course. The number of supplemental examinations allowed to any student is determined by the Faculty Council concerned. Notification of permission which may be granted to write one or more supplemental examinations is included in the statement of marks sent to all students.

    The percentage of term marks carried forward to a supplemental examination will be determined by the Department and Faculty concerned.

11. **Deferred Final Examination.** A student who has missed a final examination because of illness or domestic affliction or who is obliged to absent himself from an examination for some other compelling reason (including religious convictions) may apply for a deferred final examination to be written at the time of the regular supplemental examinations (see section 6 above).

12. **Examination Fees.**
    (a) Final examinations: No fee is levied for final examinations written during the regular examination periods.
    (b) Supplemental Examinations: A fee of $10.00 is charged for each supplemental examination written during a regular supplemental examinations period. Application for September examinations received after August 10 will not be accepted.
    (c) Deferred Final Examinations: A fee of $5.00 is charged for each deferred final written during regular supplemental examination periods. The fee for special deferred finals requiring the setting of special papers is $10.00 per paper.
    (d) Special Supplemental Examinations: For special supplemental examinations a fee of $15.00 is charged for each subject.
    (e) Outside Centres: An additional fee of $5.00 per subject is charged for writing supplemental examinations in established centres other than Edmonton and Calgary.

THE FACULTY OF ARTS

THE GENERAL PROGRAM

Students who are planning to begin work in the Faculty of Arts in the Evening Credit Program should contact the office of the Dean before registering.

First Year

English 200; an Arts course; a laboratory Science course; two options; Physical Education.

Second Year

An Arts course; a Science course; three options.

Third Year

An Arts course; four options.

Notes:

1. Each student must include in his program a minimum of three courses and a maximum of five in a principal subject of concentration, and a minimum of three and a maximum of four in a second subject of concentration.
2. There may not be more than seven junior courses in the program, except by special permission of the Dean.
3. A student registering for the B.A. degree must choose his principal subject of concentration in the humanities or in the social sciences.*
4. To be awarded the B.A., the student must present credit in at least eight courses in the humanities and the social sciences.

Graduation Requirement

To be granted the B.A. degree, a student must present passing grades or better in a minimum of fifteen full-year courses, and a stanine average of at least 5.0 on all courses credited towards the degree after the first year.

B.A. AFTER B.ED.

Holders of the B.Ed. degree, whose programs include thirteen Arts and Science courses, may qualify for the B.A. degree by completing a six-course program as prescribed by the Faculty of Arts. Those with fewer than thirteen Arts and Science courses will be required to take additional courses.

Students who propose to secure the B.A. degree in this manner are advised to consult the Dean before registering in the Faculty of Arts.

B.A. AFTER B.SC.

Students who have qualified for the degree of B.Sc. may proceed to the degree of B.A. by completing a nine-course program as prescribed by the Faculty of Arts and attaining a stanine average of 5.0 in these courses.

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*Either the B.A. or B.Sc. degree may be taken with Mathematics as the principal subject of concentration. Students wishing the B.A. degree should consult the Department of Mathematics concerning a suitable sequence of courses.

THE FACULTY OF SCIENCE

THE GENERAL PROGRAM

Students who are planning to begin work in the Faculty of Science in the Evening Credit Program should consult the office of the Dean before registering.

First Year

English 200 or 210; an Arts course; a Science course; two options; Physical Education.

Second Year

An Arts course; a Science course; three options.

Third Year

An Arts course; a Science course; three options.

Note:

1. Each student must include in his program a minimum of three courses and a maximum of five in a principal subject of concentration, and a minimum of three and a maximum of four in a second subject of concentration.
2. There may not be more than seven junior courses in the program, except by special permission of the Dean.
3. A student registering for the B.Sc. degree must choose his principal subject of concentration in the physical or biological sciences.
4. To be awarded the B.Sc., the student must present credit in at least eight science courses. Not more than eleven science courses may be credited towards the degree.

Graduation Requirement

To be granted the B.Sc. degree, a student must present passing grades or better in a minimum of fifteen-full year courses, and a stanine average of at least 5.0 on all courses credited toward the degree after the first year.

B.SC. AFTER B.ED.

Holders of the B.Ed. degree, whose programs include thirteen Arts and Science courses, may qualify for the B.Sc. degree by completing a six-course program as prescribed by the Faculty of Science. Those with fewer than thirteen Arts and Science courses will be required to take additional courses.

Students who propose to secure the B.Sc. degree in this manner are advised to consult the Dean before registering in the Faculty of Science.

B.SC. AFTER B.A.

Students who have qualified for the degree of B.A. may proceed to the degree of B.Sc. by completing a nine-course program as prescribed by the Faculty of Science and attaining a stanine average of 5.0 in these courses. Students with incomplete matriculation for the Faculty of Science will be required to remove any deficiency.

FACULTY OF EDUCATION

THE STANDARD ELEMENTARY B.ED. PROGRAM

Upon completion of the first two years, candidates are eligible for the Interim Standard E Certificate, valid in Grades I to IX; completion of three years earns the Interim Professional Certificate, valid in Grade I to XII; completion of four years, the B.Ed. degree.

Major Fields

Each candidate must select a major field of study. A major consists of four prescribed courses, usually three Arts or Science courses, and an Education course. The following majors are available: Art, English, Early Childhood Education, French, Mathematics, Music, Physical Education, Science and Social Studies. For detailed information, consult the Calendar of the Faculty of Education.

Degree Program for Certificated Teachers

First Year

Credit granted on the basis of at least seven months of teacher education.

Second Year

1. English 200 or 210
2. Major
3. Major
4. Arts or Science option
5. Arts or Science option
6. Senior Education option

Third Year

1. Educational Psychology 476
2. Philosophy 240 or 242
3. Major
4. Approved Arts option in social science or history
5. Approved Arts or Science or Education option

Fourth Year

1. Educational Foundations 492 or 496
2. Major
3. Arts or Science option
4. Senior Education option
5. Senior Arts or Science option

Notes on the Program

1. The following courses, which are being offered in the 1966-67 Evening Credit Program, may be presented as approved options under item 4 of the program for the third year; Economics 200, Geography 201, History 370; Sociology 202; Political Science 200, Sociology 202.
2. Graduation Requirements:
   (a) A stanine average of at least 5.0 on all courses credited on the last two years of the degree program.

(b) Students must include in their programs an approved Arts or Science option from each of two of the following six fields: Art, drama, mathematics, music, physical education, and science. (Exclusive of the **major** field.)

3. The following courses, which are being offered in the 1966-67 Evening Credit Program, may be presented in fulfilment of requirement 2 (b): Act 230, 240; Geography 201; Mathematics 274.

THE STANDARD SECONDARY B.ED. PROGRAM

Upon completion of the first two years, candidates are eligible for the Interim Standard S Certificate, valid in Grades IV to XI; completion of three years earns the Interim Professional Certificate, valid in Grades I to XII; completion of four years, the B.Ed. degree.

Major Fields

Each Candidate must select a major field of study consisting of seven courses —a core of five prescribed courses and two supporting courses. The following major fields are available: English, French, German, Latin, Social Studies, Mathematics, Biological Science, Physical Science, Art, Music, Drama, Household Economics, Business Education. For detailed information consult the Calendar of the Faculty of Education.

Degree Program for Certificated Teachers

First Year

Credit granted on the basis of at least seven months of teacher education.

Second Year

1. Major
2. Major
3. Curriculum and Instruction (major field)
4. English 200 or 210
5. Approved arts option in social science or history
6. Major
7. Major or Arts or Science option

Third Year

1. Educational Psychology 476
2. Philosophy 240 or 242
3. Major
4. Major or Arts or Science option
5. Senior Education option

Fourth Year

1. Educational Foundations 492 or 496
2. Major
3. Senior Education option
4. Major or Arts or Science option
5. Major or Arts or Science option

Notes on the Program

1. At least three courses in the major field must be completed by the end of the second year.
2. Graduation Requirement: A stanine average of at least 5.0 on all courses credited on the last two years of the degree program.

FACULTY OF BUSINESS ADMINISTRATION AND COMMERCE

The curriculum in the Faculty of Business Administration and Commerce is based upon a four year program. During the third and fourth years of the program the student may pursue a general course or may major in Economics, Accounting, Personnel, Finance, Production or Marketing.

The first two years of the program may be completed through the Evening Credit Program. The final two years may be taken only in the regular Winter Session.

THE BACHELOR OF COMMERCE PROGRAM

First Year

Accounting 202
Business 202
Economics 200
English 210 or 200
Mathematics 240
Approved Arts or Science option

Second Year

Accounting 204
Business Law 310
Psychology 202
Computing Science 351
Mathematics 243
Business 308
Business 320
Approved half-year course option

DETAILS OF COURSES

Notes:

1. The University reserves the right to impose registration quotas on or to withdraw any of the courses here outlined.
2. The number of hours of instruction per week for both terms is shown at the top of each course description. The first figure in a set of two indicates lecture-hours; the second, laboratory hours. The letter "L" attached to a figure signifies lecture-laboratory hours, and the letter "S" seminar hours.
3. Only courses marked with an asterisk (*) may be presented for credit on B.A. or B.Sc. degrees.

ANTHROPOLOGY

***Anthr 415**—R. Frucht (3-0; 3-0)

Comparative Social Systems—The comparative study of non-western societies in terms of lineage, clan and kinship systems; associations; caste and class systems; band, tribal and primitive state forms of political structure.

Prerequisite: A course in Anthropology or Sociology, or consent of the Department.

ART

***Art 230**—D. Cantine (1-4; 1-4)

Fundamentals of Design—The study and practical application of principles of composition and picture-making, methods of construction in design, and the use of conventional and abstract forms.

***Art 240**—R. W. Sinclair (3-3; 3-3)

Fundamentals of Drawing—Theory and practice of drawing, analysis of masters' drawings; study of line, form, light and shade; portrait and figure construction; life drawing, using both long and quick poses.

BUSINESS

Bus 202 (3-0; 3-0)

Introduction to Business—Survey of the place of business in society.

Bus 308 (0-0; 3-3)

Introductory Business Statistics—Application of statistical methods to business problems. Measures of location and dispersion. Elementary probability. Binomial, normal and Poisson distributions. Prediction techniques. Index numbers. Time series.

CHEMISTRY

***Chem 350**—S. W. Gunner (10-12)

Organic Chemistry—Lectures: An introduction to a study of the compounds of carbon.

Laboratory: The preparation of some organic compounds.

Prerequisite: Chemistry 130 or 230 or 232.

COMPUTING SCIENCE

***Cmput 310**—D. A. Scott (3-0; 3-0)

Logical structure of computers; instructions, algorithms and programs; language of computer programming; conventional computers; assemblers and compilers.

ECONOMICS

***Econ 200** (3-0; 3-0)

Principles of Economics—A survey of various aspects of economics; the nature of economic problems and systems; the functions of money; commercial and central banking; national income analysis; monetary and fiscal policy; pricing under competitive and monopolistic conditions; selected topics in analysis and policy.

Prerequisite for all senior economics courses except 305, 310, 311, and 330.

***Econ 305**—M. F. Bauer (3-0; 3-0)

General Economics—An introduction to economic principles, problems and policies with emphasis on the Canadian experience.

Note: Open only to senior students who do not hold credit in Economics 200 or 302.

***Econ 350**—J. Salyzyn (3-0; 3-0)

Public Finance—A study of the conditions under which individual economic goals can be maximized through nonmarket mechanisms. Problems in the allocation of resources, redistribution of income, and stabilization of the level of resource utilization. A frame-work for analyzing taxes and the goals of a tax system. Patterns and trends in government expenditure and revenues. Objects, principles, and techniques of compensatory fiscal and debt policies. Special problems of interest to the class.

Prerequisite: Economics 200 or 302.

EDUCATION: Curriculum and Instruction

Ed CI 346 (formerly 316)—Helen Kerr (3-0; 3-0)

School Library Services.

Prerequisite: A teaching certificate.

Ed CI 361—W. R. Dralle (Red Deer) (3L; 0-0)

Audiovisual Instruction I—Theory of audiovisual instruction; types of communications media; principles and techniques of teaching with such media; preparation of selected audiovisual materials; operation and care of specialized equipment.

Ed CI 363—W. R. Dralle (Red Deer) (0-0; 3L)

Audiovisual Instruction II—Selected case studies; experimental and developmental uses of instructional devices; implications for the classroom teacher, the individual learner, class and school organizations, and the aims and purposes of education.

Prerequisite: Ed CI 361.

Ed CI 426—Sheila Gracey (3-0; 3-0)

Curriculum and Instruction in the Kindergarten.

Prerequisite: A teaching certificate.

Ed CI 480—M. A. Nay (3L; 3L)

Advanced Curriculum and Instruction in Secondary School Physical Sciences.

Prerequisites: Two courses in physical sciences, and Ed CI 278 or 478 or consent of department.

EDUCATIONAL FOUNDATIONS

***Ed Fdn 492**—N. A. Battacharyya and D. MacIver (Camrose) (3-0; 3-0)

Philosophy of Education.

Prerequisite: Philosophy 240 or 241 or 242. For holders of approved degrees other basic philosophy courses may be accepted by the department.

***ED Fdn 496**—K. H. Thomson (3-0; 3-0)

History of Educational Thought—An historical study of the significance of thinkers whose intellectual activities have influenced educational theories and practices in the Western World.

Prerequisite: Philosophy 240 or 242. For holders of approved degrees other basic philosophy courses may be accepted by the Department.

EDUCATIONAL PSYCHOLOGY

Ed Psy 310—M. Gulutsan (3-0; 3-0)

Personal Adjustment in Education—Dynamics of behavior, emotional and social adjustment of school children; teacher adjustment; social adjustment in the classroom.

Prerequisite Ed Psy 276 or equivalent.

***Ed Psy 476**—G. M. Dunlop and D. R. Cameron (3-0; 3-0)

Educational Psychology—Individual differences; psychology of learning and forgetting; motivation; personality, adjustment, and mental hygiene; introduction to evalution and the testing program.

Prerequisite: Ed Psy 276 or Psychology 202 or equivalent.

Ed Psy 478—R. K. Gupta (3-0; 3-0)

Measurement and Evaluation — Measurement of classroom achievement; teacher-made and standardized tests; interpretation and use of test results; evaluation of non-academic achievement; recording and reporting pupil progress.

Prerequisite: Ed Psy 276 or equivalent.

Ed Psy 508—D. C. Fair (3-1; 3-1)

Problems in Educational and Vocational Guidance—Theories of vocational development and choice; group standardized tests and inventories.

Prerequisite or corequisite: Ed Psy 476.

Ed Psy 510—H. W. Zingle (3-0; 3-0)

Theories of Counselling—Theoretical foundations; values, concepts of normality, and mental health; professional issues.

Prerequisite or corequisite: Ed Psy 508 or consent of Department.

ENGLISH

***Engl 200** (3-0; 3-0)

A Survey of English Literature from Chaucer to the Twentieth Century—A close study of representative masterpieces. Essays and tests of the prescribed literature will be given to afford practice in setting down ideas in good English.

***Engl 210**—W. Pilkington (Evansburg) (3-0; 3-0)

English Language and Literature—English 210 is designed to increase appreciaton of good literature and to afford practice in setting down ideas in good English.

***Engl 383**—D. Killam (3-0; 3-0)

American Literature from 1900—A selection of representative major writers from 1900 to the present.

Prerequisite: English 200 or 210.

Note: Not to be taken by students with credit in English 394.

***Engl 392**—G. Zytaruk (3-0; 3-0)

The English Novel—Representative novels by Defoe, Richardson, Fielding, Smollett, Sterne, Goldsmith, Austen, Scott, Dickens, Thackeray, Trollope, Brontë, Eliot, Meredith, Hardy, and Forster.

Prerequisite: English 200 or 210 or equivalent.

Engl 398—Sandra Saunders (3-0; 3-0)

Children's Literature—A historical and critical study of literature written for children with attention to the interaction between children's literature and educational theory. The course will bring to the attention of prospective elementary teachers some of the world's resources in good books for children.
Prerequisite: English 200 or 210 or equivalent.

Notes:

1. This course is restricted to B.Ed. students in the Elementary Route.
2. This course may not be presented for degree credit in the Faculties of Arts and Science.

FRENCH

***Fren 330**—R. G. Motut (3-0; 3-0)

French Language and Civilization—This course is especially designed to improve both the spoken and written language of students. It consists of literary selections from representative French authors, contrastive phonetics of French and English, oral work in class and intensive drill in the language laboratory.

Prerequisite: French 200 or 201.

Note: This course, designed for teachers and prospective teachers, will not overlap, or serve as a substitute for Education CI 258.

GEOGRAPHY

***Geog 201**—S. I. Smith (3-2; 3-2)

Physical Geography—A systematic study of the origin, nature, and distribution of elements of the natural environment. Land forms, weather and climate, vegetation, soil, water, and mineral resources will be related to each other in place. The laboratory work will complement the lectures and will include interpretation, study, and preparation of maps and charts.

Note: Geography 201 is classified as a natural science course.

*Geog 300—O. F. G. Sitwell (3-0; 3-0)

Human Geography—The significance of human distribution on the earth. Man's relation to the physical environment; world population problems; cultural patterns in the world; aspects of political and economic geography in selected world trouble areas; racial geography and urban geography. Students planning on taking this course are strongly urged to precede it by Geography 201.

Note: Geography 300 is classified as a social science course

HISTORY

*Hist 307—G. A. Rothrock (3-0; 3-0)

Europe in the Seventeenth and Eighteenth Centuries.

*Hist 370—E. A. Mitchner and R. R. Hett (Edmonton) (3-0; 3-0)

Canada—A survey of the political and social history of Canada.

LINGUISTICS

*Ling 389 (formerly English 389)—G. D. Prideaux (3-0; 3-0)

Modern English Grammar—A survey of several approaches to the description of modern English grammar.

Prerequisite: English 200 or equivalent.

MATHEMATICS

Math 243 (3-2; 0-0)

Linear Algebra.

*Math 274—A. E. Livingston (3-0; 3-0)

Algebra and Geometry—Logic and sets. Axiomatic geometry. Projective geometry. Rotation of axes. Graphs of poylnomial functions. Linear equations. Vectors, matrices and determinants. Mathematical systems (scales of notation). Mathematical induction. Binomial theorem. The axiomatic approach to the number system. General algebraic systems.

Prerequisite: Mathematics 30.

*Math 360—S. A. Naimpally (3-0; 3-0)

Geometry—Various concepts of space (Euclidean, affine, projective and non-Euclidean), axiomatic treatment and models, relation to group theory. An introduction to point set topology (open and closed sets, Hausdorff and metric spaces).

Prerequisite or corequisite: Mathematics 304 or 306 or consent of department.

*Math 374—E. Phibbs (3-0; 3-0)

Algebra and Geometry—Selected topics in projective and other non-Euclidean geometries. Groups, rings, fields. Vector spaces. Lattices and Boolean algebra.

Prerequisite: Mathematics 274 or consent of the department.

PHILOSOPHY

*Phil 240—M. Cohen, M. Wright and G. Price (Red Deer) (3-0; 3-0)

Introduction to Western Philosophy—This course is designed to introduce the student to the main problems and theories that have dominated philosophical

thought in the Western world, through the study and discussion of selected philosophical classics. Emphasis will be placed both upon a sound acquaintance with the main outlines of our philosophical tradition and upon the ability to handle philosophical ideas independently. To this end both lectures and discussions will form part of the student's training.

POLITICAL SCIENCE

***Pol S 370**—S. M. M. Qureshi and N. Linton (3-0; 3-0)

Politics of Emergent Nations—A study of the institutions and politics of selected nations in Asia, Africa and Latin America.

PSYCHOLOGY

***Psycho 202**—R. Stretch (3-0; 3-0)

Introduction to General Psychology—A survey of problems, methods and principles in various fields of psychology.

***Psycho 353**—P. P. Rempel (3-0; 0-0)

Developmental Psychology—A study of behaviour as it is related to normal development and aging.

***Psycho 383**—P. P. Rempel (0-0; 3-0)

Personality—An introductory survey of the area of personality including a study of representative theoretical points of view and research relevant to the major problems in this area.

Prerequisite: Psychology 202 or equivalent.

SOCIOLOGY

***Soc 202**—W. Meloff (Viking) (3-0; 3-0)

Introductory Sociology—An introductory analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society is analysed in terms of its structure, culture and social ranking schemes. The interrelationships between the various institutions (e.g. family, church, school, government) are considered. The processes are examined whereby the individual is socialized into society, as are the sources of conformist and non-conformist behavior.

***Soc 341**—P. M. George (3-0; 0-0)

Social Psychology—An introduction to the study of individual and group behavior observed in social processes.

Prerequisite: Sociology 202 or 402 or Psychology 202 or Educational Psychology 276.

Note: Sociology 341 and Psychology 341 may **not** both be taken for credit.

***Soc 343**—P. M. George (0-0; 3-0)

Collective Behavior—Analysis of various forms of collective behavior, including crowds, mobs, panics, audiences, fashions, fads, cults, etc.

Prerequisite: Sociology 341, or Psychology 341, or consent of the department.

Soc 370—R. M. Pike (3-0; 3-0)

The Family—Structure and function of the family, comparative family systems, sociology of family life stages (such as childhood, adolescence, adulthood, old age), contemporary trends and problems of the family.

Prerequisite: One previous course in Sociology or consent of the department.

ACADEMIC STAFF

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